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Concerning the Dome of St. Paul's.

THE vast scheme for a treatment of the whole interior of St. Paul's in polychromy, about which so much excitement was got up when it was first seriously propounded, has completely collapsed, *pro tem.*, at all events, and we may be pretty sure that it will hardly be revived on the scale which was imagined before, when it was actually proposed to reface the whole interior with marble. At present the wishes of those who are still enthusiastic on the subject are concentrated on the idea of getting the dome decorated, as a central point to which further decorations can be worked up, as the best means of expending the money subscribed in a manner which will make sufficient show to give a good idea of what is contemplated, and to awaken public interest and enthusiasm in the further carrying out of the work. In this judgment the promoters of the full scheme are from their point of view probably right. At the same time, it would be a very serious responsibility to enter upon any treatment of the dome so marked in character as to be manifestly and decidedly dependent for its proper effect upon the completion of the whole building on a similar scheme, and to appear obtrusive otherwise. The elaborate decoration of the whole building is a scheme, the ultimate accomplishment of which is so very doubtful, and which must in any event be so indefinitely postponed, that whatever is done with the dome ought to be what may, if necessary, stand alone without producing an absolutely unsuitable or obtrusive effect.

We are promised that a facsimile of whatever is proposed shall be placed *in situ* for public criticism before anything irremediable is done; a provision which we were very thankful to see, and which we make no doubt will be duly fulfilled. In the meantime, several schemes have been before the public, and more very likely will be; the idea is naturally a highly interesting one to artists and architects, and even those who do not look forward to any chance of carrying out the work may find a pleasure in in showing how they could do it. That made by Mr. Heath Wilson and Mr. Pullan, already mentioned in our columns, is the latest.

Both this design and the one purchased by the Decoration Committee from the representatives of Stevens, the sculptor (and which was commented on at some length in the *Builder* for July 27, 1878), have the merit of assimilating with the architectural style of the building; a merit in one sense, though involving defect in another sense, for the assimilation includes, of course, the faults of detail and lack of pure taste which characterises the architecture of the period more or less, even in the hands of such a born architect as Wren. And it is an æsthetic question of some difficulty and delicacy whether, in carrying out decoration in a building originally designed in a faulty style of architectural detail, the deficiencies of style are to be adhered to for the sake of uniformity, or whether the right principle is to design the decoration in a spirit of pure taste, and make it as good as it can be in itself independently of the building. Our own feeling would be that it is impossible to escape entirely from the influence of the style of detail in the existing building, however faulty we may think it; and that the object should be to assimilate the new decoration to the architecture, while avoiding or softening down as far as possible the most decidedly faulty characteristics of the original style. It might be possible, by careful treatment and study, to realise in this way a decoration which would be such as the original architect would have approved, and at the same time much superior in taste to what would have been done in his time. Indeed, one almost trembles to think what might have been the result if St. Paul's had been elaborately painted in the taste of the period in which it was built, by painters of the calibre of Verrio. On the other hand, the attempt, which has been fortunately frustrated, to decorate St. Paul's in a style founded on Byzantine art, would simply have resulted in killing the architecture of the interior.

Neither Stevens's nor the Wilson-Pullan design have anything in them unsuitable to the architecture of the building. On the contrary, they are evidently studiously designed to harmonise with it. Stevens's, in fact, is full of the worst faults of taste characteristic of the period whose decorative style it revives: nondescript architectural details supporting figures, and supported on the bodies of figures, and so on. The design now exhibited at the Egyptian Hall avoids these worst features of Verrionese decoration, and is in much better taste and much more architectural. But there is this very important *per contra*, that Stevens's design really evinces genius, and has a largeness and a sort of majesty about it of which we certainly find no trace in the new design offered to our consideration. The latter shows a good deal of taste and careful consideration, but nothing of genius. As weighed against Stevens's, and against what we might have a right to expect from the distinguished artists who are understood to be now elaborating the new scheme to be submitted on behalf of the Decoration Committee, we might, therefore, dismiss this from the category of possible treatments of the dome, giving due credit to the authors for their spirit in undertaking the preparation of it, and for the degree of thought, and in many respects of good taste, which it evinces. One or two points in the design, however, as well as the mere fact of its exhibition, give occasion for a word or two as to the general question of the treatment of the dome, supposing it to be carried out at all.

Supposing the interior surface of a dome to be made the occasion for pictorial decoration, it is optional with the decorating artist either to treat it purely as a hemispherical surface of homogeneous character, or to connect his painting with the architectural design of adjacent parts of the building, by an architectural framework to his pictures, designed to carry out the lines of the actual architecture. The presence of the solid piers which occur at regular intervals in the drum upon which the dome stands, may seem to furnish a hint for the architecturalised subdivision of the painted design. Stevens, as we pointed out at the time of noticing his design, did neither one nor the other; he divided his design by what appeared like ribs springing above each pier, but which really consisted of a mere super-position of features having no appearance of constructional continuity. Messrs. Wilson and Pullan adopt an architecturalised treatment, and carry it out in a marked manner, dividing their design by strongly-marked painted ribs over each pier, the ribs being elaborately decorated with arabesques, and forming a kind of frame between the pictures, and so far this architectural portion of the design is very suitably treated. But it seems a mistake to carry a strongly-marked horizontal architectural feature across each compartment about one-third from the base of the dome, as the designers have done. The effect of this would be, when seen in execution, to make a strong horizontal belt round the dome, which would cut its curve in an awkward manner, and give a heavy effect, interrupting the eye in following the rising curve.

Now it is certainly worth notice that Thornhill's design, the extinguishment of which is threatened, is in one point superior to either of these in the method of architecturalised treatment. It adopts the subdivision suggested by the piers, and carries it on by painted pilasters and niches in the dome, which is a rather too positive and obtrusive architecturalism; but there is no halfway break in the design; the arches between the painted pilasters are very cleverly treated, so as to aid the upward perspective of the dome, and to appear designed for the situation: the whole effect of the architecturalised framework is such as to assist in defining the contour of the dome, and in this respect it is really very good; what it wants is some modification of detail, so as to render it less like actual architecture and more like (what it ought to be) a design founded on architectural detail, which has been modified to suit its position and artistic function. In this respect Messrs. Wilson & Pullan's rib divisions are better; but their introduced architecture is not so good; it is as

decidedly imitative architecture as Thornhill's, and it is not, like his, fitted to assist the perspective effect of the dome.

It may, however, be a question whether the subdivision of the dome, in accordance with the architectural substructure, is the most desirable method of treatment for a decorative scheme. The dome is architecturally an unbroken hemisphere, and it seems questionable whether its architectural expression is not, to some extent, impaired and contradicted by a treatment which breaks it up into sections. The one positive reason for doing this is, perhaps, that if the dome is made the field of pictorial representation, divided into a series of subjects, these subjects must be subdivided or framed in some way, and in that case a correspondence of the pictorial subdivision with the architectural subdivision beneath it becomes a necessity. But it may be very much questioned whether a treatment which breaks the unity of the great concave hemisphere, and masks and confuses its curves, is not really an injury to its architectural effect. Look, for example, at the result in this respect which such a design as Messrs. Wilson and Pullan's would have if carried out. We have, first, an architectural composition on a foreground plane, full of angles and breaks, in painted perspective, and with a horizontal cornice cutting across the dome at one point in its rise, so as to make a marked horizontal line where the architectural construction gives no reason for one; then, above this line we look through, apparently, into open air-space, where angels are flying, with a blue sky seen between them. The idea of the concave roof is thus impaired, the whole surface is broken up, and we have the effect of looking through the painted architecture into space. Now, it is surely not the object of decoration in such a position to do away with the substance of the dome and make us look through it into space. The dome is a roof, and its decoration should make it appear as such, and not aim at taking the roof off by an ocular deception. In this respect Thornhill's paintings are better in keeping with the situation than anything we have yet seen proposed to replace them, except Mr. Penrose's own purely decorative design, which, as far as we remember it, from a casual glance some time since, was purely a roof decoration and not a picture, and as such represented a true principle of architectural decoration, though we might not regard it as giving all that could be desired for the situation.

Then there is the further and still more important question, whether figure subjects of the highest class of pictorial design are suitable to such a situation at all; whether they are not actually thrown away. Who, in looking at the existing decoration from below, really studies or considers the figures, as he would if they were pictorial subjects exhibited in the usual manner on a vertical surface nearly level with the eye? It is impossible to do so; the attitude necessary for their examination is too uncomfortable and unnatural, and the figures are too much distorted by their perspective position: the general effect only is taken in. This general effect is tolerably satisfactory as regards line and balance of form, and as defining the contour of the dome; it is unsatisfactory chiefly from its deadness of effect, owing to the want of positive colour. But if it is to be replaced by a new design, it is really a point to be seriously considered, whether it is of any use to place in such a position figure-subjects of a high class, and such as require special study and examination to realise the character and expression of individual figures. Such a situation is not, we must think, suitable for picture painting, in whatever medium. It is a situation for architectural decoration, not necessarily excluding the figure, but introducing figures in such a manner as to contribute to producing a general effect in a semi-conventional style of treatment, not necessitating individual study of character in each figure, which is really thrown away in such a case; and the grouping of the design should be such as to emphasise the contour of the dome as an unbroken hemisphere hung over the centre space of the building, and not such as to break it up and mask its real contour and architectural construction.

The existing decoration, as we have said, does this pretty fairly; and let us ask, in conclusion, is it worth while to deliberately paint it out at present for the substitution of a new design, and have we good reason to hope that we shall get anything better in its place? Surely it would be worth while to consider whether its too dead and colourless effect might not be relieved for the present by some decorative gilding or powdering introduced at suitable points of the decorative or architectural portion of the design and on the backgrounds; and then leave it until its repainting or restoration becomes a necessity. It has been once repainted at a comparatively recent period; it will in due time require such a renovation again. It will then be time to consider whether it is worth while a second time to repaint it, or whether anything better or more effective can be introduced in its place. We very much doubt whether its removal at present will lead to the substitution of anything that will compensate for the loss of a design which has much merit in its way, and has the additional claim of long association with the building.

GLEANINGS AFTER GLADSTONE ON BEAUTY IN MANUFACTURE.

The opening of the fine art exhibition at Chester in aid of the funds of the local School of Art, was the occasion of an interesting and highly-appreciated speech by Mr. Gladstone on beauty in manufactures,—a subject which, naturally enough, and doubtless with especial advantage under the circumstances of the times, he treated in relation to a period of commercial struggle for which it behoves the country to husband its means,—to extend its resources. The question, as might be expected, was opened and illustrated with precision and force, and the audience showed by "loud applause" that the orator had awakened or strengthened their conviction most effectually that "to unite all forms of beauty, all the varied qualities of beauty, with the different characteristics that make up the utility of industrial productions, is the true way to the success of our national enterprise and commerce." The subject, however, has more aspects than could be embraced in a speech with definite limitations of time and also of audience; it may be worth while to glance at some of these. Beauty in manufacture is certainly a very merchantable, marketable article. A very few visits to Christie's auction-room during the London season will bring home that fact to our sensibilities. How far workmanship can enhance the value of the most ordinary materials is perhaps not more astonishing than how it can render the intrinsic value of the most precious materials relatively insignificant. Even the extravagant prices which are often given for objects that are of comparatively inferior excellence are to be explained by a contagion of competition that has its origin in a more genuine form, that is propagated by the instinct of imitation among the less wisely appreciative, from the example of the fully-justified eagerness of true connoisseurs for the possession and preservation of works of such originality and excellence that no rivalry or imitation can render them otherwise than unique. The moral of the value in exchange commanded, in commerce, by the Beautiful, as well as by the Good and the True, is only too easily pointed by reference to the success of competitors, of the French especially, whom we now, wiser or happier than our fathers, are able to recognise as our natural friends, whatever our rivalries, if only because they are by natural conditions our nearest neighbours. Let this, then, be admitted, but how far does it conduct us? How far will the conviction that beauty "pays" carry us forward to the attainment of it? Not very much is to be hoped from the morality that takes a new departure from the maxim, "Honesty is the better policy: I have tried both;" what is to be anticipated from a culture of beauty which is prompted chiefly by the experience that ugliness has proved a commercial failure? The search after beauty that is so inaugurated is pretty certain to take its direction from the earliest hint as to what is the kind of beauty that will at the moment pay or will pay best, and be constantly liable to diverge into the bypaths of the momentarily fashionable.

We hear sometimes,—we hear how often,—that the hour produces the man, the demand ensures the supply;—statements these, which, being interpreted from the sententious to the commonplace, read very much like assurances that we have only to want something very much and we shall be sure to get it. What truth the axiom contains is that at least we shall be sure to try for it; and that until we vigorously try for it our chance of getting it is small indeed. But even with adequate resources at hand, it is possible to search London through for more than one object, be it but a coalscuttle or decorative flower-pot, which a correct taste may fairly require to complete the mere furnishing of a moderate dwelling-house, and find that it does not exist, or certainly is undiscoverable. The alternative is presented of accepting what is not vulgar, only because it is hopelessly neutral, dull, and tame, or something which combines extravagance of form or colour with an extravagance of expensiveness, wherein the dealer fairly admits lies the main objection to it with his special connexion, not on the score of excess, but of the reverse; he is troubled by inquiries for it in more expensive form, without any stipulation as to whether it shall be in better taste, or even as good; and how from its nature it can be made more expensive he is somewhat at a loss to know. Demand,—effective demand, as a political economist would define it,—demand with money in its hand, may go about the world in search for many a form of beauty in manufacture, and be heard of again only as returning home with the money unexpended in the purse or the pocket. The theorists are many, and Mr. Gladstone on this occasion takes up a position very near to them, who hold that they go to the root of the matter in demanding rescue at the hands of the workman. "We want," he says, "to carry the work of improvement to such length that it shall not depend on the spirit or enterprise of this or that master, of this or that workshop or factory. We want to get it into the mind and brain and heart and feeling of the working men; that is what we want." These are very wholesome and very encouraging words for the ears of the working man; but there is a word at least as wholesome, if not quite so encouraging, that must be addressed to his other ear: the manufactures are but limited in number and extent in which the most accomplished workman can give effect to his powers independently of a factory and the contingent organisation of commerce; individually and isolated, it is for the most part too true that he can do no more "than Cæsar's hand when Cæsar's head is off." Society is organic; when it ceases to be organic, it is a social system no longer; and the true problem is, how can effective furtherance be given for such development of the interdependence of skilled and accomplished workmen, enterprising manufacturers, and a public which demands and will take off beautiful manufactures, such as only can be produced by, or continue to be produced in virtue of, such a combination.

At which end, then, are we to begin, or can we find an end? If the artisan is helpless without the manufacturer, the manufacturer is no less dependent on a correlative public; it seems that all the factors must exist together if they are to exist at all, and, in fact, to come into existence together,—a phenomenon which it is not easy to conceive. The grass must have time to grow if the herbivore is to exist, and unless the herbivore has time to mature and to propagate, the duration of the carnivore will be brief indeed. Or, let us say, perfect tools can only be made by help of perfect machinery; but what engineer can construct a perfect machine without the assistance of perfect tools? We look round for some guidance as to the possibilities available in precedent, and are confronted by the example of Josiah Wedgwood. Here we seem to have proof that the manufacturer is the truly central principle and germinant power. Within a comparatively short life he certainly brought a very original form of art to high perfection, and by combination of taste with commercial instincts of a very marked character, stood in common relation to a staff of chemists, designers, and accomplished artisans on the one hand, and to an appreciative public on the other. There is much appearance here that he created his workmen and his public also; that he had the skill to teach the world at large how to appreciate graceful art, and the workmen of his new Etruria how to produce it.

"When shall such heroes live again?"

Live they do at this present; heroes, at least, of no less effective qualifications, if not exactly directed to the same ends. In columns of the *Times* lying parallel to those which record Mr. Gladstone's speech, we may read, if we are so minded, a description of the establishment at Essen, from which Herr Krupp has supplied 20,000 cannon to various Governments, and brought gunnery to a perfection which

leaves nothing to be desired by those who happen to be at the right end of the course of his projectiles.

But we have only to press the comparison a little closer to find how much allowance is to be made for another factor,—the receptiveness of contemporaries. The genius of artillerists is not created by the fact that nations, wherever the fault may lie, find themselves in the hands of military rulers whose passion it is to turn entire nations into standing armies; still, only under such circumstances can the arts of scientific destruction be pressed to their uttermost development. A certain number of favourable coincidences are required for the production of any works, even of the highest genius, in the highest possible perfection. In the England of Wedgwood there was a happy excitement of interest in the recent discoveries in Italy of ancient pottery of exquisite beauty,—an interest which, at the same time, was not cramped by pedantry or strict antiquarianism, and in consequence did not exclude an appeal to modern predilections as well as to associations with antiquity. Certain previous advances, again, of a very important nature in improvement of selected and treated materials, are observable as conditions in either case, as well as antecedent training and schooling of bands of workmen. But when the production of ethereal beauty and not of the agencies of brute force is in question, we have to observe that the classes which contribute the aid of actual manipulation,—call them all artisans if we please,—follow on in a series, almost without a break, from the merest hodman to the supremest artist. So far as the artisan can and does have a claim to make an original contribution to the beauty of result, he has a fair claim to a title superior to that of simple workman, mechanic, or artisan. His own claim may be to be considered and called an artist; but the resources of language do not allow us to dispense with economy in the employment of words, and we shall find the title of artist required with reference to other qualifications.

The art-workman has a standing and a distinction of his own; but at last he will usually have to estimate his position by relation to the highly-skilled workman who is sometimes not far behind him, rather than to the artist who is far above. Very admirable is the precision of hand which is attained in numerous manufactures, from joinery upwards;—a precision which it seems marvellous that a designer should ever be able to count upon to reduce his ideal model to reality. Still, we can by no means put the execution of good work upon prescribed and unalterable lines in the same category with work which makes demand not only on manual dexterity in this form, whatever its perfection, but on the exercise of fancy, or of imagination, or of free variation in execution. When the workman advances beyond this limit, he becomes an art-workman, he is entered as an art-workman, but he has still a course of earnest application and studious self-culture before him if he is to be entitled to the approbation of Mr. Gladstone as having "made the pursuit of beauty a part of his regular apparatus of life." However, there seems no reason why the education of workmen, up to even the very first stage of this development, should not relieve life speedily from somewhat of its tameness and dulness. In the patterns of common earthenware, for example, we see how compositions of much elaboration are repeated by a process of copying by transfer, which we would willingly exchange for a design incomparably simpler, that a practised hand could apply direct with as little trouble. What is it that attracts us in a series of Japanese trays of the size of saucers, each of which bears only a tiny bird and a spray? Similar as they are, we find on comparing them that each was painted freely; no two lines, which correspond generally in purpose and in position, are precisely alike; the lines are very few, but sufficient, because all expressive, and the large proportion of uncovered space is in such true relative proportion to the design, that it conveys no suggestion of vacuity through poverty of ideas or neglect. It may be true that a superior hand gave the exemplar which is thus repeated with such facile grace; but repetition with facile grace is characteristic of artistic faculty, and has inestimable value in appealing unobtrusively, but not without effect, to our sympathies with nature.

Unless our schools of art are productive of a numerous band of art-workmen, call them what we will, who are at least equal to such an exercise of unrestrained and unhampered execution, there must be something very wrong indeed in their system of instruction. The very life of art is inventive variation, which we have seen has a certain scope even in adaptation of a set copy; but the process of mere mechanical copying, of which the perfection demands the exclusion of any personal impress of the copyist, may be conducted, doubtless, with much exercise of conscientiousness as well as skill, and so far forth is trustworthy; but the full meed of praise of contributing to the beauty of manufacture belongs, in the first instance,—which is all but equivalent to saying in the last also,—to the author of the example to be copied. When the boundary, however, is once overpassed, then, as we have said, the career of invention is open, and invention may find range which seems to extend to infinity in a numberless succession of stages,—if only in the forms of vessels of all kinds, and so onward in decorative compositions, from rivalry with the willow-pattern plate to the design of Flaxman for the shield of Achilles.

Considering what large numbers of students are now on the rolls of the schools of art, it will furthermore be hard, indeed, if some of exceptional, of even highest capability, do not declare their powers in due time,—and time is already pressing,—to reward the national confidence by manifestation of genius of even more than national interest; but here, as in the case of a Flaxman, or of a Chantrey as a more precise example, we leave the question of beauty in manufacture, or are supposed and ought to make it a principle to do so. It will often be only a vanishing line that divides the art-workman and his artistic work from the artist proper and his work of fine art; but the line is a real line; its termination may be as difficult to determine as the precise limit of the solar penumbra, but we are not on that account to falsify terms and contest the reality of distinction between shadow and broad sunlight.

We must not, moreover, give way so far to a false enthusiasm of liberality as to suppose that the simple workman will, or indeed can, develop into the true art-workman by simple application, however conscientious, and by force of will, with nothing to work upon. A certain primary endowment—"gifts that God gives"—to take Dogberry's words as seriously as he intended them, but with more logical applicability, is a primary condition, and then must external aid, which now does not fail, be supported by resolute energy. We laugh at the labourer in *Punch*, who encourages his countryman: "This is the country, Tim, to earn your money; you've only to run up and down a ladder; a man at the top takes the bricks and does all the work." But there is a truth in the jest, which comes home to reflection while we laugh. The extremest muscular toil will be accepted by multitudes as ease itself for the sake of exemption from the most moderate mental strain. This is "the dead part of the stroke" which must be overcome by the more ambitious by the accumulated energy that is best provided by a certain extension of general cultivation,—the cultivation which accustoms the mind to a variety of ideas, and to variation of aspect relatively to the same ideas. Imagination, which is the soul of art, must be ministered to by the intellectual stores which do not accrue spontaneously, while highly-strung moral purpose is at once the primary condition and the predominant force which must bind all energies into unity at last. Not very much is to be hoped for in development of the love and pursuit of beauty, if a starting-point is to be taken from a theory of duty in work which is consistent with slurring present work to provide work in the future—with giving fictitious finish which will pass while withholding solidity that will endure, and with systematically starving the quantity as well as the quality of the work that can be put into an hour. Different, indeed, is the spirit in which the men of professions—the men of business even—keep themselves at the wheel, in which the student who seeks for truth at any cost is unceasingly urgent, vigilant, pre-occupied. The relaxation of moral fibre involves even that of muscular, and leaves little chance, indeed, for the enthusiasm without which it is impossible for art to be born, and which is "like the air it breathes, if it has it not it dies."

The kind of mental culture which might best supplement the technical instruction of the art schools would probably be such as would direct itself at once to the enrichment of the intellect and the excitement of the imagination through poetry. In this respect it is unfortunate that so large a proportion of the finest English poetry should be quite above the heads of all who do not unite to a sensibility for poetry a very full and extensive liberal education. We have contemporary poetry of very high merit; we may even say that what contemporary poetry we have of the highest merit, is even more difficult of appreciation by an ordinary reader than that ode of Gray, which he declared could only be complained of as difficult by those who were not familiar with Pindar. It will be a very different England, indeed, in which Milton will ever be genuinely popular and genuinely appreciated by the mass of the people. The very power of reading his epics or "Samson Agonistes" with the rhythmical effect that is necessary to give poetry a fair chance is a rare accomplishment; and he constantly takes for granted a readiness to apprehend allusions that are as remote from the associations of ordinary readers as those of Lycophron. It was of extraordinary value for the general education of the Greeks that the poems which were at once the most important and excellent and the most extensive were in a style which could be universally understood. There is no English translation whatever of the "Iliad" and "Odyssey" which fairly brings home to the English reader how simple is the Homeric phraseology. The translator either into verse, rhymed or blank, into either prose or poetry, has invariably thought himself bound to give the ideas of the ancient a certain clothing of so-called poetic diction, or a tincture of the unusual or the stilted; and even when the vehicle is prose, to foist in a phrase from time to time, which, as Biblical, is assumed to be simple, but which, in fact, strikes the modern reader as an obsolete solecism,—an effect which never was produced in antiquity by the Greek equivalent.

Shakspeare is most nearly to modern England what Homer was to the Greek; that is, as our greatest poet, and a poet who is largely engaged upon truly national themes. But in the case of Shakspeare, no less than of Milton, to read him well is an art, and unless his poetry is read well, with appropriate emphasis, intonation, and rhythmical feeling, it is "not understanded of the people." Even as soon after his death as at the Restoration, it sounded strangely. But it will not do to reconcile ourselves to the general world losing hold of it, and leaving it to be nothing more than a study for a clique of antiquarians or enthusiasts or grammarians. Something is now being done with sedulous care to explain all his unfamiliar words and constructions to the schoolboys, but this process penetrates very little way even when it penetrates at all. What is really required for popular education is a popular theatre, at which Shakspeare's plays should be represented so frequently and so well that his language should explain as well as recommend itself. Alcibiades, it is told, broke the pate of a schoolmaster whom he found pretending to instruct youth without a copy of Homer on the premises; we may excuse our own School Boards from the responsibility with regard to Shakspeare, if we can only secure the better introduction of his spirit into the very minds and hearts of our population by well-established publication in that form, and with those aids and accompaniments for which he originally and exclusively bodied forth the form of things unknown.

But however artisans, skilled workmen, art workmen, artists, and manufacturers, may become embued with poetic feeling and enthusiasm, and accomplished in the training of all necessary kinds, the predilections of the public as the patron will enter into the problem as an ultimate factor. One man, it is said, may bring a horse to the water, but be the water the very font of Hippocrene, and however copious it may be, it may still flow in vain, for a hundred men cannot make it drink. Must we, then, be driven to hold the artist excusable who sighs for a tyranny of an individual or a corrupt aristocracy,—of a family of Medici,—of an Augustus or worse, as the last chance for the arts, as alone capable of bringing about the union of unstinted funds with large schemes, and exaction at once and appreciation, of universal finish and refinement. It is a continental reflection, of long standing, upon Englishmen that we are a nation of shopkeepers, and the English are themselves responsible for the proverbial currency of the dictum that it takes three generations out of trade to make a gentleman. England is not, happily, about to retire from business in any sense; but this being so, it is incumbent upon us to adopt such a general and generous culture as shall disprove our own

proverb, and make the foreign imputation equivalent to a compliment, by showing that the training which is fostering a capacity for the realisation of beauty in manufacture, is met from above by a refined and lively appreciation of the beautiful by those classes that occupy the political place of the gifted but, in so many ways, untoward patrons of the earlier and later Renaissance.

THE NORMAL ARCHITECTURE OF SCHOOLS.

The principle that the amount of light that will, on a gloomy day, fall on the desk of the scholar, should be taken as determinative of the proportions of the school-room, especially with reference to the area and position of the windows, is one that hardly requires any lengthened argument in its favour. Of course it is not a principle that is to be worked to death. But it is one founded on physiological reason, and calculated to supply a normal guide to the architect, of which he is so greatly in need.

Without going into any optical details, it may be remarked that the effort of learning to read is, perhaps, the greatest strain to which the infant brain is ordinarily exposed in this country. And without venturing to assert positively that such is the fact, we may observe that there are many observations collected which tend to support the belief that the children of highly-educated parents afford but little measure of the much greater difficulty experienced by the children of those more unfamiliar with the alphabet, in acquiring a rudimentary knowledge of letters. That the strain thus put upon the youthful brain ought to be diminished, by the careful consideration of those who are responsible for their educational career, in every available way, is a proposition that may be termed self-evident. What is required is, that all effort should be made, as far as possible useful effort, and not mere strain. If any one wishes for a practical illustration of the effect of light in facilitating the act of reading, we recommend them to make this trial. Persons gifted with perfect eyesight, and who are not so far advanced in life as to need any aid from spectacles, may be challenged as jurors in this matter. They cannot fairly estimate the difficulty that attends feeble or untrained vision. But let any man who cannot read,—let us say the advertisements of the *Times*,—readily without spectacles of the second or third degree of magnifying power, take that paper into the open country on a bright day. He will be able to read without his glasses. Such, at least, is the outcome of personal experience. That an adequate amount of light thrown on the desk or book of each scholar is a primary requisite for the distribution of the plan of a school building we will, therefore, now assume. It remains to be inquired whether we have any means for determining what that amount of light ought to be, and how it is to be measured and provided.

The diminution of the illuminative power of a source of light in proportion to the square of its distance from the illuminated object is a result of the proportion known to exist between the radius of a sphere and the area of its superficies. If we look at the matter as if reversed, and suppose the illumination to come from the superficies, and to be concentrated in a focus, the law will be the same, stated inversely. If we regard a vertical window as a source of illumination, it is at once apparent that only a portion of the illuminating power of the sky that spreads over the locality can strike upon the window. Immediately within the window the eye would receive only about one-eighth part of the light that would fall on it if the observer stood, let us say, on the roof of the building. This will become manifest from the following consideration.

If an observer stands on a level plain, light will fall on him from an arc of 180° north and south, and also from an arc of 180° east and west. If we suppose the point of observation to be in the middle of a cube, with glass sides, light will enter from the upper face of the cube from a spherical area of 90° by 90°; and on each side it will enter from a spherical area of 45° by 90°. Thus the light entering on the top will be one-fourth, and that entering on each side will be one-eighth, of the atmospheric light transmitted from the sky, assuming the whole light to be equally diffused, as on a day when the sky is covered with clouds.

If we now consider the incidence of the rays of light on the glass, and omit, for the sake of distinction, the consideration of refraction, absorption, or dispersal of the rays, it is manifest that the light which would pass through the window to any point within the apartment will be directly as the size of the window, and inversely as some function of the distance of the observer from the plane of the glass. Striking at every angle, from the smallest subtended from the zenith to the horizontal, the light will enter, and as the eye is removed from the plane of the window (as will be at once seen by a simple diagram), a constantly decreasing number of rays will fall upon it. And although refraction and dispersion will vary the details of any particular observation, the broad fact of the proportionate incidence of the rays will remain the same: so that we shall not go very far wide of the mark if we take the illumination of any given spot in a room from a window as equal to one-eighth of the atmospheric or outdoor light of the time and place, multiplied by the area of the window, and divided by s times the distance of the point of observation from the plane of the glass. This is assuming the glass to be perfectly diaphanous. In point of fact it absorbs some 10 per cent. of the light that falls on it. For the sake of simplicity, let us at first assume $s = 1$.

We then have to consider the proportion proper to be borne by the windows to the walls of a room. If we turn to an authoritative work on design for buildings in this country to ascertain what proportions are ordinary, we are met with the unsatisfactory information that "every room and every passage is to be sufficiently lighted from the external atmosphere." But we are inquiring into what that sufficiency is, so that this dictum does not help us. If we turn to the "Dictionary of Mechanics" for more information, we are told that "a window is an aperture to admit light,"—which we knew before. Transparent windows, we are further told, were a curiosity in the time of Seneca. Glass windows were introduced into England by Walford, Bishop of Worcester, in 736. "Trefoil openings, within triangles, are of the time of Edward I. In the reign of Richard II. they were divided by upright mullions, dividing the window into lights." "Cast glass was introduced into England in 1773." All this is interesting information, but it is not that of which we are in search. We know, in point of fact, that from the time of Alfred to that of Henry VII., there was a steady increase in the proportion of the perforated or illuminating area of the window, as compared to that of the arch. In the ancient tower of the church of St. Mary, at Guildford, which bears still the "strips" of the Saxon builders, two very ancient window openings yet remain. They are of the rudest form, splaying both without and within, till they are reduced to an aperture too small for a man to squeeze through. Defence from the Dane, or some other marauder, was, no doubt, the object. If we turn to such a work as the "History of Modern Architecture," we shall find an extraordinary diversity in the proportion of window area to wall shown in the illustrations, but nothing to guide us as to the principles adopted by the architect. In the Whitehall banqueting-house, the windows, which Mr. Fergusson characterises as well proportioned, measure rather less than an eighth part of the wall in which they are pierced. In Wollaton House, they appear to occupy one-half; in Longleat, measuring the glass, and not including the mullions, less than one-sixth. One-seventh is a proportion not unusual in some of the finest buildings in Italy. But a small window in that climate would admit a quantity of light equal to that transmitted by a much larger window in England. Thus, if we seek for guidance by measuring buildings, we find a variation of from less than one-ninth to more than one-half of the wall to be pierced for light, and are forced to arrive at the conclusion that the architect has not so much considered the absolute quantity of illuminating surface allowed for windows as a proper function of the plan of his building, as he has regarded the perforations as picturesque features of the elevation.

If we take the largest proportion of which we have found an instance, namely, that of the principal face of Longleat, we shall find that the light actually admitted into that portion of the house is one-sixteenth of the atmospheric light. This portion of light, less 10 per cent. due to the absorption of rays by the glass, is that which actually enters the room through the windows. But as the windows themselves are only one-half of the area of the side of the room, or the proportion we have selected, there will not be, in any part of the room where the illumination is equally dispersed, more than one thirty-second part of the intensity of the illumination that would be obtainable, at the same time, at a point of observation on the unshaded roof of the house. But the proportions of the noble windows of Longleat are very rare. One-sixth or one-eighth of the wall-space is as much as is usually allowed to window room in ordinary buildings. Thus we come to the fact that in a large school-room, lighted with one row of windows, the proportion of the free atmospheric light that is utilised for the eye of the scholar is but a fraction of the full light of day, avoiding, in both cases, the direct rays of the sun.

As to the difference of the distribution within the apartment of the light which actually enters a room, let any man who wishes to mend a pen, or woman who has to thread a needle, reply. It may be in the memory of many old public school-boys how a worthy master, whose hair had not begun to turn grey, in a very well-lighted apartment, in which the windows were on the long side of the room, habitually took his position close to a certain window in order to mend his stock of pens. We intimate what occurs to us as a rough mode of measuring the loss of light in a room. We shall be glad to see the subject discussed on scientific principles; and be the loss of light more or less, there still remains the question for the physiologist to answer,—"What is the smallest proportion of the atmospheric daylight of a locality that ought to be used to illuminate the primer of the child who is learning to read?"

It ought not to be necessary here to say much in deprecation of the practice of cross-lighting. Let us ask any person to whom a pure and good light is an object, and the answer will be the same. Diffused light is the best for most purposes of vision (we are not speaking of the use of the microscope); cross-lights interfere with that function. From the engraver who erects a paper-screen to throw a soft light on the surface of his copper, to the painter who selects a northern aspect for his studio,—this view of the incidence of rays of light is habitually taken as a guide to practice.

We thus arrive at two indications as to the plan of rooms intended for the study of the young which cannot be neglected with propriety. One is, that the form of the room should be oblong, the light being admitted on the long side; and that increase of accommodation should be obtained by increasing, not the depth, but the length of the room. That is to say, room is to be made by prolonging the side in which the windows are placed, of course multiplying the windows in the same proportion.

The second remark is, that as the quantity of light which will be transmitted into a room through a square foot of horizontal roof, if diaphanous, is on the average double the quantity that will be admitted through a square foot of vertical window, serious and systematic attention should be given to the subject of lighting from above.

We are aware that this will be regarded as a heresy by some writers. "Avoid also," says one authority, "the use of skylights." That special care is requisite in the use of roofing glass we fully admit; and considering the question as that of roof alone we should not (at least until tempered glass has become one of the available materials of the builder) consider that tiles, slate, or metal could be, without disadvantage, replaced by glass. But what we have to consider is not the best material for a roof. We want to find out how, in the best manner, to transmit the requisite amount of light to a school, and we cannot, therefore, omit to point out that the fact that a double quantity of light comes through a horizontal, as compared with a vertical, pane, is one that the architect is bound to show, at all events, that he has considered in his design.

We have spoken of 10 per cent. of the light being absorbed by the glass. Recent experiments on the absorbing power of glass, in connexion with the electric light, have here confirmed the estimate long since made by the illustrious Faraday. Mr. Faraday invented a very beautiful arrangement for burning gas, in which, by means of a double chimney, the products of combustion were prevented from mixing in the air of the apartment. But the double chimney was found to absorb so large a proportion of the light produced, that this admirable sanitary arrangement was laid aside.

It has to be remembered that pure, bright glass is here spoken of, and that any inferiority in the tint or structure of the glass used in windows causes a direct diminution in the transmitted light beyond the allowance thus made.

Very little reflection will show that a proper regard to the illumination of the school-room will produce a direct effect, not only on the plan, but also on the elevation, of every well-proportioned school building. It will do so to an extent that will affect the choice of style. The principle of avoiding cross lights and of admitting a definite proportion of the light of day into a room, will lead to the establishment of the rule that school-rooms must be oblong, and lighted from the long side of the room, unless they be lighted from the roof, in which case the shape of the plan may be left to be determined by other considerations. Those of our readers who are familiar with the reading-room of the British Museum know what lighting from the roof means. We are much mistaken if persons who are accustomed to work in that noble apartment will not be found very zealous advocates for the adoption of that method of lighting. We may ask the reader to compare the illumination of that room with that of Westminster Hall. Of course, the use of stained glass in the splendid window at the south end of that great apartment arrests much of the light that would otherwise pass through so large a perforation in the wall; but the effect on the eye of a body of light coming through a large window,—let the experiment be made in St. Paul's Cathedral,—and by an equal amount of illumination transmitted through a lantern, is very different. Nor do we suppose that there can be much difference of opinion as to which mode of admission of light is most favourable for any work that requires a sustained effort of the eye.

We do not conceal the fact that considerations of this nature may be found to militate against those ideas of pictorial effect which we should be the last to undervalue. But the utility of his work should always be, with the architect, a consideration prior to that of its pictorial effect. We have little doubt, indeed, that the finest pictorial effects have been produced rather indirectly than directly. The quaint nooks, and gables, and pinnacles, and re-entering angles of our Domestic-Gothic work, are only admirable when they arise from the requirements of plan. When they are "put in" for their own sake, they almost invariably appear to be what they are, namely, shams—like artificial ruins erected to give a mendacious dignity to a newly-planted estate. Thus we feel that there will be little hesitation on the part of the true artist in adopting the suggestion that, in attempting to design a large school, we should first decide on the proportion of the atmospheric light which is, all things considered, the best to admit to the desks of the scholars, and that we should then proportion the size, shape, and lighting of the large school-rooms so as to follow the rule thus laid down.

It is more than probable that the outcome of the study will be unfavourable to the use of gabled buildings with pointed windows. A steeple-sloping roof, with deep eaves, and boldly-carved barge-boards, a house framed with black timbers, and covered with a dense veil of ivy, a small casement, projecting through the ivy below the gables,—these are things that delight the eye. The artist loves to linger amid such scenes, and to reproduce them. The venerable tower or spire of the village church, the shadow of lofty elms, the chorus of evening-retiring rooks,—all these are associated in our memories with the lowly-gabled porch of the village school. But where are the villages themselves? They are, in very many instances, turned into towns. The old pictorial charm is taking flight; and, whether or no this be the case in any particular spot, there are few districts of the country in which the growth of the population is not so rapid that the arrangements which might have been adequate for the schooling of the children of the last century are antiquated and ineffective for those of the present, to say nothing of the approaching twentieth century.

Bearing in mind that we are rather inviting architects and students of architecture to accompany us on a sort of professional voyage of exploration, than attempting to lay down any rules of our own prescription, we suggest the advantage of careful investigation of the effect of different modes of illumination. There is, for example, an arrangement as to which we can only speak from the glance caught from the window of a railway carriage. On one of the metropolitan lines, close in the vicinity of the Victoria Station, is a large group of sheds, on which the alternate slopes of the roofs are covered with slates and with glass, the slopes to the south, on which the rays of the sun might at times strike directly, are slated, and those to the north, on which this incidence is impossible, glazed. An arrangement of this kind will admit into the building light from a spherical surface of nearly 90° by 45°, or a very large proportion of the atmospheric illumination. When a building of that kind exists, it is so much gained in the way of experiment. What we require to know is,—how far will such a method of lighting answer? How far would it be available for the special purpose of school illumination? What we desire to have is a sound practical judgment, formed by a competent authority. The establishment of a series of observations of this nature would be of very high professional value.

We may note that photography furnishes the means of a direct metrical comparison of the illuminative power of different windows. What is needful in this case is that observations should be simultaneous. The number of seconds of exposure of a photographic print, or of a piece of sensitised paper, on the same day and hour, in different rooms differently lighted, or in different parts of the same room, that produce an equal depth of tint, could be noted. There might be a comparision made of the depth of tint produced in equal time, but the measurement by time would probably be more exact.

At all events, our object will have been gained if we have called to this important subject the attention of those who are competent to take up the inquiry and to advance it to its proper results. We want the verdict first of the physiologist, as to what proportion of the ordinary atmospheric light is the best to be thrown on the desk of the child. We want the opinion of the practical photometer as to the illuminative effect of different forms of window, of lantern, and of skylight (distinguishing by the two latter terms the horizontal from the vertical admission of light at the top of an apartment). And when this first step is taken, we do not doubt that the genius of the architect will clothe with proper structural beauty the rude skeleton that has been provided for his use by the physiologist, the optician, and the photometer.

DRAGON WORSHIP.

"LA TARASQUE."

Two years ago I promised to send you the particulars of a very curious ceremony existing in the south of France, probably the last of its kind in Europe, that of "La Tarasque." But the conflicting statements made by authors and authorities cautioned me to be careful that my information should be exact. Hence the delay. The British consul nearest the locality laughed at my inquiries, and denied the existence of the ceremony except in Mediæval times. Murray's Handbook states the ceremony does not exist, and Joanne, a careful French writer, gives the *fête* of St. Martha as the day of "la Tarasque," which is wrong. But for these contradictions I should have thought it unnecessary to give the authority guided by which I have for two years examined into the matter by several visits to the locality, and which, I felt sure, from its source and the manner in which the information was given me, was quite reliable, the communication being made to me personally by the Marquis of Bute, during an entertainment given by the British Minister at Athens, two years ago. What I saw on my first personal inspection might, I thought, possibly be an exceptional or accidental affair, but having been made for the purpose an honorary member, *pro tem.*, of the Society of St. Martha, I have attended the various ceremonies, and the following account is from personal observation. The ceremony of "La Tarasque" is a religious one of great solemnity. La Tarasque is a huge dragon, about 17 ft. long, which is pursued through the streets of the town of Tarascon by a large body of clergy, richly attired, and chanting solemn litanies, the foremost in the procession wearing scarlet and lace, and the remainder being in deep mourning and lace. High mass is celebrated before the march commences, which is constituted as follows:—A number of maidens, covered to the feet with long white veils, bear and keep guard over a magnificent white silk banner, thickly embroidered in gold, representing the Virgin treading on a serpent. Then the daughters of the upper classes in the town, in ordinary dress, following a second rich banner of the Virgin and the infant Christ; a body of black-veiled nuns then bear a pink-and-blue banner, representing St. Martha habited in the same colours, which are those of the saint who is treading under foot the Tarasque, and delivering a child, already in its mouth, from death. Then follows a magnificent half statue of St. Martha, life-size, in silver gilt, decorated with precious stones and costly Limoges enamels, beneath a handsome *baldaquin*, each of the four corner pillars having the form of a serpent twined round it. Here follow the clergy chanting, and at each interval the chant is taken up by the nuns both in black and white veils, so that it wanders along the procession without ceasing. Then follow a number of youths in costume, and the rear is brought up by the principal burghers bearing candles. The procession numbers several hundred persons, and all except the youths and veiled nuns are uncovered. Sixteen men are required to carry the dragon, which is of great weight; of these, four are placed on each side externally and internally, and one in the head to gnash the jaws of the beast; and, on the Feast of Pentecost, to issue fire from the nostrils. The dragon has a guard of men dressed in Mediæval attire bearing the veritable arms used from time immemorial in the ceremony of "La Tarasque," and which are, therefore, of great antiquity, and are kept in the "Mairie" with jealous care, and only brought out for the purpose. They wear vizards of cloth in form of chain armour worn up or down at pleasure. They have to clear the way for the dragon and guard it from injury by the crowd. Immediately the clock strikes five (p.m.) on the first Sunday *after* the *fête*-day of St. Martha, bells ring, drums are beaten, and cannon are fired, and the pursuit commences, the procession issuing from the church of St. Martha, then parading in front of the château of King René, and following the Tarasque, which flies through the streets to escape the saint. On its way it is seized by a pretty maiden, about twelve years old, in pink and blue, who acts as a lay St. Martha, and who attaches a pink ribbon to its neck and assumes to drag it along; the dragon gnashes its jaws furiously, runs hither and thither in the crowd to the terror of the young and amusement of the old, the armed men make feints of attacking the crowd, with like results. The streets being narrow and tortuous hardly permit its passage with a single file of persons on each side. After traversing the town it finally takes refuge in the Place St. Martha, near the church, here it is overtaken by the procession, and as the silver-gilt effigy of the saint, with the clergy following, advances, it makes three vast demi-vaults into the air and falls prostrate before the figure. The procession then re-enters the church, and another service, jubilant in a high degree, is held, and the effigy of St. Martha placed in front of the altar, amidst hundreds of candles and a highly magnificent display of altar-plate, jewelled with lavish outlay.

Your readers will be disposed to put all this down as a remnant of a ceremony of the Middle Ages, and it is true that during that period, and also retained for a long time afterwards, a special part of the procession was introduced in character with the customs of the times, which made the spectacle more like that of the Lord Mayor's Show, but this has since been abandoned, to which may probably be attributed the impression that the whole was obsolete; but those parts have nothing to do with the religious ceremony, which is like several still existing in Brittany, and which may be traced, more or less, along the whole route marked by the remains of that extraordinary people who, according to Strabo, conveyed the tin procured in Britain through Gaul, by a long horse traffic down to Massilia (Marseilles). Mention of this part of the ceremony would be highly interesting would space permit, but there is new matter which I venture to supply, as I think it gives evidence of the great antiquity of the ceremony. But I may be allowed to say that such part consisted of a cavalcade of knights, headed by Toison d'Or, and followed by what appears to me a part of the primitive ceremony, viz., the various pastoral callings, the craftsmen of which carried the fruits and implements which distinguished them, and which probably originally formed offerings to their local divinity; a pastoral dance then existed, and all the et-ceteras of a saturnalia,

which represented the age of gold, and the ceremonies of an ancient pagan faith, as recorded by French authors. All agree in its remote antiquity; according to the clerical tradition, it dates back to the first century, but as this was simply the date of the release from the dragon which had long infested the district, of course the dragon goes much further back, and a French author, Amédée Pichot, goes so far as to date it back to the time of the Trojan war, or the flight of Israel from Egypt. As to my own experiences, it was deeply interesting to find myself taking official part in a ceremony still having so many ancient and Mediæval features, in a town quite unaltered in its Middle Age aspect, and with a population in its original costume; to march under the battlements of the castle of King René, the poetic king of Provence; and to see before me the times and scenes figured so graphically by Scott in "Quentin Durward" and "Anne of Gierstein," and still more so with the vast emblem of the earliest Pagan faith that the world probably ever knew. The following is extracted from a ballad of Provence, in the original *patois*:—

"Ha! quand courrié la vièio masco,
Lagadigadèu! la Tarasco!
Que de danso, de crid, de joio e d'estampèu
La vilo morno s'enlumino,
Res que faguèsse en Coundamino,
Mies qu'en o de meiouro mino,
Voulastreja pèr l'èr la Pico e lou Drapèu."

Which may be rendered,—

"Ah! when the old witch ran,
The *gadon gadon*,* the Tarasque!
When during dances, cries of joy and revelry,
The dull town illuminates itself,
No other did in Coundamino,
Better than he (the Knight of the Tarasque) or more full of grace,
Make to fly in the air the pike and the banner."

With the actual visible worship of the living serpent amongst two of the peoples in Africa whom our army has lately had to attack, in the west and south, there is little to investigate, for it is difficult to surmise what originated the worship. But I have selected the district of the Tarasque, where the ceremony of the subjugation of that worship exists in all its features, to endeavour to trace out its meaning, but not its origin, as the worship seems to me to have there a marked, though local, intent. As my obtaining these facts required much time, and a considerable expenditure, I venture to send some points which came under my notice, and should not otherwise intrude so far on your valuable space.

Assuming this worship to have existed very anciently with the various settlers on the north side of the Mediterranean, who, whether Phœnicians or others, must have been acquainted with the worship of Egypt and of the colonies in Africa, we find it perpetuated along the banks of the Rhone and the Loire. There is good evidence that Gauls and Phœnicians,—in short, the first settlers,—occupied lofty sites, as well to defend their positions, to watch against hostile approach, and as places of worship. The Rhone must in those days have been subject to more frequent and more dangerous floodings than those experienced in late years, which have been severe enough, the whole district having evidence of being repeatedly washed by rivers seeking egress. It is remarkable, also, that the sites occupied in the earliest times are those which have been successively occupied by succeeding people all over the south and west of Europe, hardly any spot so appropriated having been wholly abandoned. Tarascon stands out in bold relief under these heads. It is referred to by Ptolemy as an ancient town. On the former site the Romans built a castrum and a temple,—a Corinthian capital still remains; the early barons built a château and a church. It was of sufficient importance for the sojourn of Pope Urban II. in 1096. In 1146 the barons were summoned here to render homage and fidelity to the Count of Provence, and it still maintains a position commanding respect. But there are similar evidences on all the now occupied and original sites along the district I have examined from Brittany to Marseilles. To keep to the latter district, we have at Marseilles, Arles, St. Remy, Tarascon, Avignon, Orange, Mont Dragon, Le Puy, Puy de Dôme, Gergovia (Clermont Ferrand), and others, not only the same features of successive occupation, both in civic and religious structures,—Gaulish, Ligurian, Phœnician, Roman,—but others in coins, ancient Roman and Mediæval architecture, traditions and customs which have a strong visible representation of the dragon or serpent, and are not found in the surrounding districts. Thus even around Avignon and Tarascon the buildings have no evidence of the kind. The ancient Roman architecture is most to the point, for it could have had no emblematic suggestion of the triumph of a pure religion over a foul one, and it is in the ancient Roman architecture and sculpture of the localities that the serpent and dragon are unmistakably, and not metaphorically, illustrated. On the ancient Papal mint facing the palace of the popes at Avignon, the dragon of the Gauls and the eagle of Pagan Rome are placed in positions of equal importance, and alternate equally in every case. This was clearly a compliment to the locality, and shows that, notwithstanding Christianity, the dragon was still a badge of the Gauls. On the ancient Roman triumphal arch at Orange, the *draconarius*, or standard of the dragon, is profusely introduced with the other trophies of spoil taken from the Gauls; all the standards are Gaulish, the Roman eagle being nowhere apparent. They include, besides the *draconarius*, standards of the dog, pig, wolf, &c.; above these towers the magnificent *rayonnant* head of Phœbus, indicating the triumph of Rome; with two dragonesque sea-gods consenting as it were to Fate. At St. Remy, on the finely-sculptured mausoleum, sacred no doubt to the Romans who fell in the combat with the Gauls, as represented at the base, the frieze is occupied by dragons, as consenting supernal deities; in short, the Romans appropriated the chief god of the locality. At Arles and Avignon, amongst other examples have been disinterred fine sculptures illustrating the serpent as dominant. The one called Mithra, which I should think is Serapis, enfolds the body of the god in a triple coil, the other shows a vast cobra dominant over the Roman eagle, both of which stand beside a colossal figure. These are examples; but at Nîmes, which is more prolific in Roman remains than these localities, there is, as may be said throughout Languedoc as far as the Pyrenees, not in either Pagan or Christian remains any device of the sort. Mont Dragon is excepted by Joanne from any association with the dragon, except as a possession of a family bearing that title; in the same way the Rue Dragon at Marseilles is said to be only heraldic, but it has been overlooked that these titles or arms were held by the bearers of the Gaulish *draconarius*,—a standard which, as a compliment to the Gauls after incorporation as Roman freemen, was adopted by the Romans for those armies previously bearing this as their national emblem; while the dog, pig, wolf, &c., were abandoned as standards, appropriately showing the dragon as superior. That these standards were the emblems of deities there can be no doubt, as the eagle was of Jove, or supreme power; but the remarkable example of a sculptured Gaulish chief dug up at Mont Dragon, and now in the Museum Calvet, proves this to have been one of the early settlements. The worship of the serpent was evidently part of the religion of Carthage; and in the *British Archæological Journal* for March last year, I endeavoured to show that there was intercourse between Marseilles and Carthage before as well as after the Romans occupied Gaul, and in an ancient French work on the Roman remains in the above localities I now find a quotation from Isidor to the same effect.

That which has caused the perpetuation of the Tarasque seems to have risen from the devastations from flooding by the Rhone, and as the dragon was always a water deity, its fearful power would have been particularly propitiated here, even to the offering of human victims; evidence of something similar is found in Egypt. The introduction of Christianity would, of course, release the inhabitants from this fearful superstition, and the château of Christian knights was no doubt founded on the rock of refuge from inundation, which would also form the altar of sacrifice. A most remarkable pagan altar still stands in the crypt where St. Martha is buried. It is a strange corroboration that the procession is limited to those streets where the great height of the Rhone in May, 1856, is recorded,—evidently the parts most deeply inundated in former as in modern times.

Saragosa, Spain. J. S. Phené.

* Not translatable.

Death of Sir Rowland Hill.—This great public benefactor died early on Wednesday morning, in his eighty-fourth year.

THE FORTH BRIDGE.

The *magnum opus* of engineering in this country going on at present is undoubtedly the Forth Bridge. The honour of knighthood, recently bestowed upon Mr. Bouch, following as it did upon the passage of the Queen over the Tay Bridge, gave sufficient point to her Majesty's appreciation of the great work of joining the counties of Forfar and Fife. On the occasion of the dinner of the Institution of Civil Engineers, Lord Derby referred to the absence of representatives of the profession of engineering in the House of Lords, and we may safely say that so far as the achievement of success, and the surmounting of apparently insurmountable difficulties can entitle a man to further honours, Sir Thomas Bouch will have fairly deserved them when he has brought the Forth Bridge to an equally happy conclusion with its rival of the Tay. The new route to the North, which will find its complement in this gigantic undertaking, is but little known to the tourist, and is even out of the beaten highways of commerce. The linen industries of the ancient town of Dunfermline, which is situated about three miles inland from the northern shores of the Forth, have hitherto sufficed to keep up a scanty stream of passengers, which until within the last two years were conveyed in one of the few remnants of the old coaching days which still find a refuge in Edinburgh. Even the modern Athens will soon have ceased to afford them a resting-place, and in a few more years the east end of Princes-street will have lost one of its attractions in the final departure of the four-horsed coaches to which its pavements have echoed for more than a century. The situation of the Forth Bridge forcibly recalls to our minds the opening pages of the "Antiquary." It was here that Mr. Oldbuck, after his fierce passage of words with Mrs. Maclencher, delivered on his part from "her ain stairhead," and answered on her side from the "laigh shop," *Anglicè* "a cellar," in the High-street, discovered that he had missed the tide, and was therefore obliged to content himself with the companionship of Mr. Lovel and the hospitalities of the Hawes Inn. How strange Mr. Oldbuck's expressions of disappointment appear to us, within earshot of the steam whistle and the fog-horn. "'The d—l's in the diligence and the old hag it belongs to!'—'Diligence,' quoth I. 'Thou shouldst have called it a Sloth.'—'Fly,' quoth she. 'Why, it moves like a fly through a gluespot, as the Irishman says.' But, however, time and tide wait for no man; and so, my young friend, we'll have a snack here at the Hawes, which is a very decent sort of a place, and I'll be very happy to finish the account I was giving you of the difference between the mode of entrenching *castra stativa* and *castra æstiva*, things confounded by too many of our historians." These words refer to the lumbering vehicle which had brought the travellers from Edinburgh after having broken down on the way. They are supposed to be spoken within a stone's throw of the spot which is now being dedicated to one of the wonders of the world, where the modern rival of the old diligence will be whirling past suspended in mid air far above the stormy waters of the Frith, which were crossed by Mr. Oldbuck and his companion in a row-boat or pinnace, "sailing with the tide of ebb and the evening breeze." The neighbourhoods of North and South Queensferry, that have the prospect of being thus brought within the reach of all who are northward bound on the future highway of the Forth, are full of interest to the architect and antiquary. The very name of the passage recalls a period of Scottish history which was distinguished above all others for devotion to the religious aspirations which found expression in the magnificence of Gothic cathedrals. It was here Queen Margaret, the godly consort of Malcolm Canmoor, passed over the Forth when she went to perform her vows at the Church of Dunfermline, that afterwards became the burial-place of the Scottish kings. And now again, perhaps, after the lapse of centuries, her gracious descendant, who lives in the hearts of the Scottish nation as no sovereign has done since the days of the "Good Queen Margaret," may pass over the Forth Bridge and give a new meaning and emphasis to the name of the "Queen's Ferry."

When the change has been made, and when the row-boat and pinnace and paddle-boat have all alike given place to their swifter and more efficient rival of the iron road, the beauties of the Forth will be no doubt well known, and the

architectural treasures of its vicinity explored. But for us who have known them in their more primitive state, while yet the railway was far distant, and the horn of the four-horse coach sounded the hours of morning and afternoon, there is a vague feeling of regret that such repose should be so rudely disturbed, and such a fair prospect broken even by the airy outline of the bridge.

But if any consolation may be drawn from the completeness of the transformation, the mourners over bygone times will find it here. Within a hundred yards of the town where the Antiquary and young Lovel regaled themselves, the foundations of the Forth Bridge are being laid. No wayside station will replace the romantic associations of Macadam, but a world's wonder which will add lustre to the achievements of the Victorian era.

To those of our readers who are acquainted with the Forth as a Highland river, and who have never traversed the "Carse" and "Links" to where, joining the upper waters of the frith, it widens out to an arm of the sea, we must commend a visit to South Queensferry. The county of Fife, at this part of the estuary, forms its northern shore, and at intervals, where a break in the rocky coast affords the shelter of a harbour, ancient royal burghs climb up the cliffs to the level upland beyond the sea. It was the frequent occurrence of these old towns which led to the saying of a Scottish king that Fife was like a cloak of frieze with a fringe of gold. One or two have held their own in the struggle for existence, and become the centres of thriving industries, while others, less favourably situated, have fallen into decay. They are dotted all round the coast, until we reach the ancient city of St. Andrew's, whose weather-beaten towers look out upon the sombre waters of the German ocean, and are the last signs of habitation until, ascending the Tay, we come to the far-famed rival of the intended bridge. To a casual observer, the situation of North and South Queensferry, and the wide expanse of stormy water that lies between, would be more suggestive of insuperable difficulties than of opportunities for the erection of a bridge. On the northern shore a precipitous cliff of trap rock rises to an elevation of fully 200 ft., forming the easternmost extremity of a well-known harbour of refuge, called Margaret's Hope, while the other side, sloping downwards to the north, forms a bay, in whose most inland bend lies the royal ancient burgh of Inverkeithing. Due south of the cliff of Carlynose, by which the headland referred to is generally known, and at a distance of nearly one-third of a mile, there rises a rocky little island, called Inchgarvie, an ancient heritage of the Dundases of Dundas. The channel between the island and the mainland is exceedingly deep, and forms the favourite passage for vessels sailing up and down the Firth, bound to and from Grangemouth and the other seaports of the upper reaches of the Forth. It is across this channel that the new bridge is to pass in one gigantic span, so far above the stormy waters of the sea, that the rails will be nearly on a level with the top of the cliff at Carlynose. On the southern side of the island the channel continues to be of great depth, until a further distance of nearly one-third of a mile is reached, and then it suddenly becomes shallow. It is this division between the island and the shelving up of the bottom on the southern shores of the Forth that is to be crossed by the second great span, which will then pass across the shallow water by the ordinary methods of construction. Although the two spans which stretch from the precipitous sides of the Firth on one side to the shallow water upon the other will present the appearance of a continuous structure when judged by the outline of the chains, they are really two separate bridges, and the necessity for their being constructed in this way forms no small part of the difficulties with which the engineer has to contend. The top of the piers over which the chains of the bridge are to be suspended will be about 600 ft. above the sea level, an altitude which the reader may be able to realise by referring to the top of the dome of St. Paul's Cathedral, which is not two-thirds of that height above the pavement of St. Paul's Churchyard. If one central pier of such a height as this were used to support a wide expanse of continuous chain passing from each of its sides, it would be in the position of the bridge of a violin,—subjected to movements of the strings that might at any moment bring it down by the inequality of the strains upon either of its sides. It is necessary, therefore, that each span of the bridge should be self-contained, in so far that each chain passing from the northern cliff to the southern shore should have an anchorage of its own upon the island of Inchgarvie. In consequence of this a double set of anchors are required; and some idea of the extent of the foundations for this vast central structure may be formed from what has already been accomplished. On the extreme west of the island a block of brick and concrete has been built 31 ft. square and 13 ft. in height, surmounted by a stone plinth 2 ft. in thickness. This is built upon the rock of which the island is fortunately altogether composed, and forms only one-fourth part of the base of the tower, which will be built of four similar structures, each one making up the corner of a square of 121 ft. Some notion may be formed from these figures of the great extent of work preliminary to the construction of the bridge itself, but carried out as these are now being done upon the surface of a rock that rises far above the highest tides and the most tempestuous waves, they do not throw any light upon the difficulties that stand in the way of constructing a similar edifice upon the edge of a shelving sea-bed covered with a depth of water which, when it is exposed to the full fury of an easterly gale, presents as wild a stretch of billows as can be seen in the whole length of the channel. Here, again, as well as upon the cliffs and the island, provision must be made for anchoring the suspension-chains deep down in a bed of solid rock.

But while the foundations of the bridge present a long series of obstacles that of themselves will be sufficient to tax the utmost ingenuity of the engineer and the contractor, it is to the great superstructure itself that we must look for the indications of genius and originality of which Sir Thomas Bouch has already shown himself to be possessed in no common degree. A bridge that is hung in the clouds, and extends for nearly two-thirds of a mile in two spans, will afford an object upon which the winds will not fail to vent their fury. The only security against their inroads is breadth of base, and especially in the case of the Forth Bridge, which affords no opportunities of giving lateral support. In order to obtain this, the up and down lines are to be separated by a space of nearly 100 ft., and tied together by stays which will bind into one what will be practically two bridges. With this width the engineer can defy the winds.

The exceptional nature of the work has rendered it necessary to search out with the utmost care all the available resources of the iron trade, and in the choice of materials and the mode of applying them Sir Thomas Bouch is showing himself to be a master of the principles upon which the safety of such a structure depends. The chains will most probably be made of steel manufactured by the Siemens-Martin process, and the low elastic limit of this material affords an opportunity for getting rid of the deflection which in such an enormous span would have been a source of considerable trouble. The chain plates will be about 1 in. in thickness and 18 in. deep, and as each of these, in being tested, will be stretched beyond its elastic limit, the deflection due to the weight of a passing train will be practically eliminated. As this loss of elasticity is obtained by subjecting the material spoken of to a strain that is far within its breaking, though considerably in excess of its working, load, no practical objection can be offered to the proposal, while it proves an originality of resource on the part of the engineer which must appear to be very startling to those who have been accustomed to work with ordinary iron which would be rendered unsafe by a similar treatment.

Not only from the vast sums of money involved, but from the interest which attaches to the progress of the undertaking from the standpoint of the builder and the engineer, the Forth bridge will be a subject that cannot fail to command a great amount of attention. When it is finished, and we sincerely trust it may be so successfully, how paltry will the efforts of the Chinese general, Pan-ho, who has the credit of being the inventor of chain bridges, appear in the light of the great new high road across the Forth! It will dwarf the labours of Stevenson and Brunel. What a record will be stored up in all its details of the progress of mankind in the industrial arts, and of the mighty achievements of the present century as compared with the work of Fabricius and Cestius, who put the crowning finish to the old Flaminian Way! This year of grace, 1879, in which the Forth bridge is commenced, is the anniversary of the erection of the first iron bridge in England at Coalbrookdale, and it is to be hoped that the one may be as great an augury for the future prosperity of England as the other has proved to be in the past. When the bridge is completed it will, we trust, not only be a high road for commerce, but will help to open up a part of the country which has been hitherto little explored by the archæologist and architect, but which is full of interest to both. Not only do the ancient royal burghs already referred to contain many objects of interest, from the quaint "pends" of the sea-side town to the grand remains of St. Andrew's Cathedral, but on the southern shores of the Forth there are architectural treasures but little known to Englishmen, one of which alone is well worthy of the journey of an enthusiast, who will discover in the present parish church of Dalmeny a specimen of Norman architecture which is scarcely excelled by any rival north or south of the Tweed.

THE PARIS EXHIBITION OF SCIENCES APPLIED TO INDUSTRY.

More than a month since we announced the opening in Paris of the Exhibition of Sciences applied to Industry; in reality, however, only within the last few days can it be said that the Palais de l'Industrie deserves the visit of the interested observer. After a hasty inspection, it is difficult to resist a feeling of disappointment, considering the promising programme set forth by M. Nicole, the director; and those who remember the Exhibition of Fine Arts applied to Industry three years since* will certainly look in vain for many of the attractive features of that elegant and instructive show. We have here, after all, only on a small scale, the exhibition of last year on the Champ de Mars, with far too many of the features of a bazaar on a large scale.

One of those shrewd classic sentences which so aptly illustrate the intricate exceptions to the rule of the Latin grammar of our school-days attributes to Scipio's friend Ennius the philosophic declaration that what is not needful should be considered as dear at a penny; what can be said, therefore, even by an indulgent critic, of the expensive pennyworths here exhibited, which the French have so long been celebrated in producing, and which bear the title of "Articles de Paris?"

In the first days of the exhibition we had looked forward with pleasure to the possibility of a detailed description of a show which promised so much matter for the consideration of English readers, but later visits have somewhat undeceived us. None the less, many salient points are to be observed in the Palais de l'Industrie, and of some of these it is our intention to give a summary description. Departing from the classification of the catalogue, which has already been described, we will endeavour to take into consideration the various exhibits in a classification of our own, founded on the somewhat more easily-grasped division of the exhibits into the great elements which make up the house and household.

Commencing, in accordance with this plan, building materials, as the matter of early consideration in the construction of the house, merit the first place. Touching the thorny question of the architectural style to be adopted before beginning to shoot one's materials on to the site chosen, very little matter is supplied in this exhibition to aid the consideration of the question. While a widely-exercised eclecticism is repeating in the buildings that now rise in our great cities and in the country in every direction the models of the past, nature is continually offering us new materials, industry new inventions, mechanics new forces, human intellect new discoveries, all tending to combine the useful with the beautiful, the comforts of life with economy, and to place within the power of the poorest the enjoyment of many things which at one time were the exclusive privilege of a few fortunate individuals.

As an instructive exhibit few are more interesting than a case of geological specimens arranged on shelves in the exact order in which they present themselves in nature in their respective strata; the case is intended for the

* See *Builder*, vol. xxxiv. p. 1063.

instruction of young agriculturists, but its interest should be equally great for the architect and builder. The French government not long ago determined that in all the village schools, geology should form a part of the programme of education; the exhibitor has endeavoured to place within the power of each teacher the means of demonstrating the geology of his district. The cases are coloured in accordance with the geological map of France, and any district is in this way procurable. The clearness of this practical method of teaching an otherwise complicated science, by means of distinctly labelled specimens arranged in the order in which they are met with in nature, is to be commended. When we state that the whole case (an upright piece of furniture), together with an explanatory text-book, is supplied at little more than 3*l.* it will be seen what service will we rendered by the exhibitor. We recommend to Mr. Tennant, who is so well-known in England for his successful efforts to popularise the science of geology, the consideration of this instructive arrangement.

For the geologically-disposed architect or builder there is no want of exhibits to attract his attention, from the huge blocks of sandstone of the Department of the Drôme, the special advantage of which would appear to lie in the facility with which the shafts of columns and their capitals may be carved out in them entire, to the varied and effective natural cements and mortars that modern ingenuity has been able to turn to account. But interesting as may be all these exhibits to the French professional visitor, the English observer sees few means of application to the particular wants of his countrymen. Each nation perseveres in its old ways, so often ruled by natural causes. We in England build mainly in brick, while our neighbours build in stone. But the various cements introduced from different countries are now largely employed in public and private buildings. They possess the power of hardening even under water, and of acquiring with time the consistency of stone. In all the great hydraulic and maritime works they are used on account of their economy, while they serve excellently for cisterns, vases, and water-conduits, for which purpose they surpass lead and iron. For architectural decorations cement is largely coming into use abroad, as being able to resist the weather, and in many other domestic usages cement is rapidly gaining a reputation. Every mountainous country is able to produce materials for the manufacture of cement, with the aid of which, and fragments of stone, can be easily constructed the largest and stoutest buildings, bridges and embankments at the smallest possible outlay. After the various cements we come to the plasters, among which are prominent those which serve to protect walls from the destructive action of sea-water or from the corrosion of latrines and drains, as also those to prevent the appearance of dampness on the walls of houses. To the plasters succeed the various stuccoes, and the skilful and eminently successful efforts of several manufacturers to imitate marble employed in polished and fluted columns, mantel-pieces, and slabs.

Among the ornamental building materials rapidly acquiring reputation stands terra-cotta, in its easy application in cornices, medallions, and other decorated architectural features; while in France the use of zinc is far more common for the same purposes than with us. The Exhibition presents more than one specimen of work in which zinc plays an important part, and it is to be desired that its use could be introduced into England more largely than at present, breaking the monotony of the house roofs of our great cities. Roofs of zinc, when well executed with good material, last, with small expense for repair, many years. The characteristic Mansard roof has already been introduced with us, but might be oftener used with the aid of zinc.

To mention the innumerable zinc tiles, galvanised iron, the terra-cotta tiles, and bituminised felt roofing, is needless,—they are all familiar in England, where they are largely used. One exhibit that attracted no small share of professional attention in the last Exhibition is absent at the Palais de l'Industrie, the system by which the largest beams and planks are seasoned in the course of a few hours at a small expense.

In a climate like ours, the necessity for keeping out draught is imperative, and we would recommend to the practical tourist who may cross the Channel this autumn to visit Paris, not to neglect the exhibits of several inventors who have studied this important question,—one not sufficiently paid attention to in England.

To refer to the innumerable varnishes, paints, and other preservative applications, is needless. England stands foremost in their production, and it is rather to us that the foreigner looks for such than we to him. The important question of the floor can be conveniently studied in such an exhibition as this. Strength and elegance are not easily found combined with other necessary qualities; we in England have long since somewhat carelessly solved the question by the use of carpets, but the modern science of hygiene finds little difficulty in condemning their use, if not in winter, certainly in summer. The marble of Italy is too cold and too costly; wood is the most healthy, but if it is parquetried its expense becomes great; if it is waxed and polished, as it is in France, the polish is not durable, requiring constant attention and re-waxing, and admits the dust between the boards, and with this inconvenience all the ills that dust is capable of propagating, while the expense of oak floorings is great; cement pulverises with use, and stains cannot be taken out; the mosaic and the flooring which are in use throughout Venetia, beautiful as they are, are cold, and hence unhealthy, and when once they commence to wear out are difficult to repair. Terra-cotta tiles, like cement, in course of time pulverise, and are easily stained, defects to which are subject also bricks; enamelled tiles soon lose their surface, only some of the modern tiles made by our great firms being able to be used when such are necessary. For England, where carpets are rendered necessary by the climate (abroad such luxuries are little used), a custom adopted throughout Belgium, of painting the boards with several coats of paint, might be oftener practised than it already is. In winter the carpet can be laid down over such a floor, and in summer raised, its place being supplied by a few light rugs.

FROM THE BANKS OF THE SEINE.

The difficulties met with in the working of the copyright laws are not alone confined to England, and by a coincidence worthy of remark, almost at the same moment that Lord John Manners had laid before the House a Bill to amend our existing imperfect copyright laws, that much-vexed and always vexing question was receiving the attention of the French courts in an interesting suit between the heirs of the well-known painters, Horace Vernet, Paul Delaroche, and Ary Scheffer, and Messrs. Goupil, the fine-art publishers, whose right the descendants of the artists above-mentioned question, according to the terms of the law of 1866, in the reproduction and sale of the works of their respective parents, and which M. Goupil first published previous to the law of 1854. According to the plaintiffs, the permission granted to the publishers extended, in conformity with the then existing law of 1793, to a period not exceeding two years after the death of the painter, and they demand the right to claim at the expiration of the period of enjoyment, fixed at thirty years by the law of 1854, the exclusive property of the works of those authors published during their life-time by the defendants, since the currency of that law; the plaintiffs further asked that it should be adjudged that Goupil had reproduced without right the works he has published since the death of the three painters, and that he should be prevented from continuing their publication; damages were further claimed, the amount to be determined by an expert. A year since, the plaintiffs had been defeated in their suit, but nothing daunted, they have within the last few days brought the affair before the Court of Appeal; and a decision has been given. The terms of this decision cannot fail to interest many readers at a moment when the copyright laws, so difficult to clearly define and determine, so often modified, and upon which the law is as yet so unsatisfactory, are undergoing fresh consideration. Of the categories in the matter of works of art, laid down by the defendant's lawyer, the first, the case of pictures, purchased under reserve by the author of the right of reproduction, the position of the artist becoming the competitor of his purchaser was clearly shown,—a position which, as long ago as 1842, was settled by the courts deciding that the right of reproducing a picture by engraving should be understood to be among the rights acquired by a purchaser in a sale made without reserve, the owner of the picture becoming the owner of the right of reproduction. In the course of the explanation of this portion of the debate, an interesting fact was brought forward, that the well-known engraver, Mercuri, spent no less than twenty-four years in engraving Delaroche's famous picture of "Lady Jane Grey's Execution" (the picture in which the painter so successfully showed the possibility of affecting the spectators by a work in which no eyes should be seen), receiving for his work 4,000*l.*; nine years were passed on the "Beggars at the Foot of the Obelisk," for which the engraver received 600*l.* A further interesting question was raised in the course of the discussion, Who is the author of an engraved work? The author is the painter; it cannot be the engraver, any more than the printer of a printed work is the author; hence, if the painter is the author, he has the power of yielding his rights to any person substituted in his place. The defendants, Messrs. Goupil, in this manner claimed that they stood in this position, and the authors' rights had been yielded to them; their lawyer adroitly putting the case of the publishers of the artist's works being forbidden after a term from reproducing them, and hence the artist falling into oblivion. The *Gazette des Tribunaux* thus sums up from a legal point of view the decision: 1st. The agreement by which a painter gives up the right to reproduce a picture by engraving, must, in the absence of any proof or contrary presumption, be understood to mean that the painter has intended only to give up this right, such as it was, regulated in the matter of duration by the laws existing at the moment of the agreement. In case an ulterior law should prolong the duration of the right attributed to the author or artist, the benefit resulting from that extension only profits him and not the publisher, or other who would enjoy the right without paying an equivalent. 2nd. The right of reproduction of a picture does not constitute a distinct property of itself, independently of the property of the work. The sale of the picture consented to without reserve by the painter, transmits to the purchaser the right of disposing, in an absolute manner, of the object sold, and he is only exercising this right when he reproduces or concedes to a third person the faculty of reproducing the work by him purchased. Let it be remarked that Messrs. Goupil, having been acknowledged to have acted entirely in good faith, without intention to defraud, will only find themselves injured in pocket, but not in reputation by this decision. One important point has been recognised in this affair, let us hope for good, that the painter of a picture being the author, not alone of the canvas but of each reproduction, it is the duty of the law to protect him and his interests, which he may transmit, within limits, to his heirs. Let this important fact be once settled, and the business view of the question alone considered, when the artist shall have lost his rights either through want of foresight in neglecting to make agreement, or through the expiration of his legal limit of ownership, and a great step will have been made in the eventual settlement of the copyright question.

How many Parisians must there be on the banks of the Seine, who on reading the announcement of the death of M. Octave Delepierre in London on the 18th inst., will recall memories connected with his name that have illuminated their lives with agreeable recollections? It is not alone the Duc d'Aumale, as an old member of the Philobiblon, who will be reminded of the many brilliant gatherings of that luxurious little society, of which Lord Houghton, Mr. John Murray, and Peter Cunningham were conspicuous members, and who met at breakfast at each other's houses to talk over the subject of their tastes, but many a casual and well-presented visitor from the continent and America will remember with pleasure the graceful receptions at M. Delepierre's house in Bayswater, where diplomats, journalists, painters and poets, musicians and merchants, and the ordinary beauties that go to form a very wide circle, met together season after season. Writing, as we are, within a stone's throw of the famous old house of Firmin-Didot, we cannot but pause to reflect on the interesting bookish and artistic recollections that the name of Delepierre suggests.

Apropos of bibliophiles, we can with difficulty imagine that M. Garnier will greatly increase

his reputation as the architect of the new Opera House, by the club-house he has built on the Boulevard Saint Germain, at the corner of the Rue Gregoire-de-Tours, for the booksellers of Paris (the Cercle des Libraires). Notwithstanding this, the journals rashly speak of everybody admiring the architecture and the decorative beauty of the new building, to be opened in a few weeks. With so many towering houses about it, M. Garnier's new club-house is far from imposing.

It is often a question asked, not alone by the enemies of State patronage, but by those curious in the history of promising talent,—What becomes of the artists who gain the *Prix de Rome?* Here in Paris a belief exists which can only be compared to that which obtains in England with regard to the senior wranglers, that they do not often enough fulfil the expectations they raised; and certainly when such a discussion is commenced, how many are the names which instantly occur as never having gained either State or university honours? But M. Chabrol, the young architect of the Palais Royal, cannot be brought forward as another unsuccessful prizeman. Not long since we had occasion to speak of the re-opening of the Théâtre Français, and the repainting of the ceiling by M. Mazerolles,—a work, by the way, which, for rapidity of execution and for learning in design, has scarcely received its just reward of public admiration; but no small credit is due to M. Chabrol for the many other important changes that were carried out in the interior of the house, principally the ingenious modifications in the new distribution of the balcony. M. Chabrol spent his years profitably in the Villa Medici, and on his return succeeded his father as director of the works of the Palais Royal. He is now, by his recent restoration of the Théâtre Français, justly considered in professional circles as having earned a high place among modern French architects; he has already proved his practical powers in Algeria, and it was no matter of surprise that in company with M. Mazerolles, M. Chabrol should have received the Cross of the Legion of Honour. It is rarely that the sentiment of artistic beauty and its practical and useful application are to be found combined, and the French Theatre, while it will benefit largely by the interior arrangements of the house, will have to congratulate itself on the choice of an architect who has also so skilfully considered the decorative effects of these changes.

Among other innovations which will mark this eventful season in the history of the Comédie Française, must be mentioned the report that is now spread that M. Perrin has engaged a full orchestra for his theatre, in view of the revival of Molière's amusing comedy of the "Bourgeois Gentilhomme." Two rows of the front stalls will be suppressed, and again the *bâton* of the conductor will wave across the prompter's box. The orchestra of the Théâtre Français has no great traditions to boast of, except that it possessed from 1847 to 1855 a *chef* who has since distinguished himself greatly in the world,—not of Classic music,—Jacques Offenbach. Under the active direction of the future head of the contemporary school of French opera-bouffe, the orchestra of the Comédie Française enjoyed some reputation, but since the retirement of M. Offenbach it has possessed no great leader; and after the death, in 1870, of M. Ancessy, the orchestra of the "French Theatre" ceased to exist.

Sanitary "Retreats."—One of these necessary arrangements has been opened to the public in St. George's-road, near to the Elephant and Castle. It has been erected by order of the Vestry of the parish of St. George the Martyr, to the specification of their surveyor, Mr. A. M. Hiscocks, and constructed by Mr. B. Finch, of High Holborn. It consists of a slate rectangular structure, about 28 ft. long, 6 ft. wide, and 7 ft. high, enclosing within it sixteen pews, also two W.C.s at one entrance end and a caretaker's lodge at the other end, there being two entrances at either side. The closets are kept locked, and admission is obtained by 1d. fee. It is lighted at night, internally and externally, by two large spherical lamps. The pews are cleansed by a peculiar arrangement of water-jets, placed level with the roof, and out of reach, which produces a continuous sheet of water from roof to floor, washes then the gutter beneath, and passes away through traps into the drain. The floor is neatly tiled, red and black.

HENDON, KINGSBURY, AND HARROW.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

THE seventy-third meeting of the London and Middlesex Archæological Society was held on the 14th inst., at the Institution in Hendon (the room being kindly placed at the disposal of the society by the proprietors), Mr. John Green Waller, V.P., in the chair. The Vicar of Hendon, the Rev. F. H. A. Scrivener, LL.D., and Prebendary of Exeter, gave an account of the parish of Hendon, and traced the historical descent of the manor, originally held by the Abbots of Westminster at the time of the Domesday Survey, remaining in their possession until the suppression of the monasteries; and when Westminster was raised to a bishopric by Henry VIII. the Manor of Hendon became its endowment. The honour, however, was but short-lived, and the manor was granted by that unscrupulous king to one of his needy satellites, William Herbert, afterwards created Earl of Pembroke. As an instance of the slipshod manner with which grants of this kind were made, the king having forgotten all about the transaction, Herbert had to give an account of how it had come into his possession, and had some difficulty in getting it confirmed.

The old Manor House, or Palace of the Abbots, became the residence of the Herberts, who are recorded as occasionally residing at Hendon Place, as it was called. In Mary's reign, some little inquiry was made as to the disposal of the enormous loot made away with by the king and his courtiers, and Herbert, created Earl of Pembroke 1551, returned the value of the manor at some absurd nominal sum. No further inquisition was made, and the Herberts remained in undisturbed possession for several generations, one of them dying at Hendon Place. From the Herberts it passed by purchase into other families, with the advowson, which was held at one time by the famous actor Garrick. The advowson was last purchased by the present Duke of Portland. Dr. Scrivener further traced the history of some other houses and their possessors, Hendon House, and Hendon Hall, and brought his paper to a conclusion by a description of the church, to which, after having thanked Dr. Scrivener for his clear and concise paper, the society adjourned.

Hendon Church, beautifully situated on an eminence, with an extensive view to the north, has lost much of its antiquity in appearance by modern alterations. The tower seems to have been least interfered with, and has a venerable aspect, but the whole of the church externally has been stuccoed. The plan consists of nave and aisles, chancel, with north and south chapels, and western tower. The eastern part has been entirely modernised; the arcade of three arches is probably Late Decorated, but a clearstory has been added about 1530. The roof is flat, panelled and open. The chief points of interest in the interior are the following: the matrix of a once-magnificent bracket brass, 10 ft. in length, representing the Virgin and Child in a sort of canopy; at the base are kneeling figures with labels of unknown commemoration this occupies, probably, its original position in the floor of the nave; a small brass in a very loose condition close to the vestry door at the west end of the north aisle; and underneath the west gallery is the chief glory of Hendon Church, one of the finest Romanesque fonts in the kingdom; it is square in shape, with no base, and on each face is an arcade of nine intersecting arches with chevron and scroll ornaments. Dr. Scrivener was inclined to put this a little earlier in date than what one would have first imagined from its twelfth century appearance. The church is not particularly rich in monuments; there are two large ones in the north chancel, one commemorating "a serjeant learned in the law," who is represented with the purse and Great Seal of England, having held it in commission during the occupation of the throne by William and Mary, and another of a bishop of one of the Welsh dioceses. Against the south wall of the nave is a very beautiful little tablet by Flaxman; two statuettes of Religion and Faith, one on each side of this tablet, are exquisite in their delicacy and refinement. In the south chancel is a tablet to one of the Herberts, erected in James I.'s time; this is in a very bad condition, and ought to be better cared for. The president, Mr. Waller, described the font.

Carriages were waiting outside to convey the party, now mustering nearly one hundred, to Kingsbury, the next halting-place, the way to which lay through beautiful lanes skirting the Brent reservoir, embosomed in green hills, and ornamented with very finely-grown oak and elms. So thick was the foliage that considerable merriment was afforded by the efforts made to avoid being swept off the tops of the drags and omnibuses by the branches of the trees completely shading these lanes.

At Kingsbury Church the party was met by the vicar, but no paper was read, the time being very limited. The church, a simple structure of nave and chancel under one roof, aisleless, and a low shingled spire and belfry at the west end of the roof, is externally a very picturesque object, but sadly spoilt internally, some enterprising churchwarden having filled all the windows with wooden frames and imitation stained glass in "Diaphanie" or oiled paper; the walls were also powdered all over with *fleur-de-lis*, and a huge text about 2 ft. deep of very Gothic character enriches the wall plate all round. The east wall is also embellished with some imitation slabs of porphyry painted on canvas. Antiquity, as may easily be imagined, has nearly disappeared. Placed against the wall is a brass to John Shephard and his two wives, about 1520. The roof is plastered internally. There formerly existed on the south side of the church an exceedingly picturesque open timber porch, but it was destroyed not many years ago and the south door blocked. The walls are probably very early. Mr. Carlos states that there were traces of Roman tiles let in to the walls, but as the whole of the exterior has been plastered and colour-washed all traces are now covered up. The church, which is dedicated to St. Andrew, possesses two very sweet-toned old bells, one very ancient.

The hon. secretary with some difficulty got his party together again, for the place was so charming and, although so close to London, so thoroughly rural, that it could scarcely be realised that it was only five miles and a half, instead of 500 miles, from Hyde Park-corner; but as Harrow was to be reached by four o'clock, no further time could be allowed. The lanes from Kingsbury to Harrow were, if possible, even more lovely. Skirting Wembley Park on one side, and meadows in which the hay was just being carried on the other, the air being heavy with the scent of the new-mown grass and the hedges lined with wisps left by the loaded wains, the party went on, past red-tiled barns and snug farmhouses, scattering the barn-door fowls and driving the ducks to desperation, until their waddle had to be supplemented with their wings; past residences with trim lawns and greenhouses, showing unmistakable signs of the late storms, until the ascent of Harrow-on-the-Hill was reached, and reins were slackened and a halt was made at the King's Head, and every one having safely descended, the church was first visited. Here the visitors were received by the Rector of Harrow, the Rev. Hayward Joyce, M.A.; but in consequence of there being service an adjournment was made to the old fourth form-room of Harrow School, on whose venerable oak panelling has been carved many a name illustrious in our annals,—a quaint room with a large stone fireplace on one side opposite the door, the master's throne at one end, and round the walls, raised on steps, massive oak forms of Spartan severity, cut and hacked with many an initial and more ambitious name,—Spencer Perceval, the murdered Prime Minister; Richard Brinsley Sheridan, Lord Byron, Hartington (Duke of Devonshire), Sir Robert Peel, Temple (Lord Palmerston), and a host of others not unknown to fame. To save time, Mr. S. Weyland Kershaw, M.A., Librarian at Lambeth Palace, read a paper on the Manor of Harrow and its connexion with the Archbishops of Canterbury; a connexion very early in our annals, for previous to the year 822, Kenulf, king of Mercia, took it from the church at Canterbury, but it was afterwards recovered by St. Wilfrid, and at the Domesday Survey it is stated to be the land of the archbishops, and that it was taxed at 100 hides, and the value, estimated in King Edward's days at 60*l.*, only then returned 50*l.* It was then called "Herges," or Harwes. In 1170 St. Thomas à Becket was here, about the 16th of December, exchanging civilities with the Abbot of St. Alban's, and getting him to go to Woodstock and effect a reconciliation with the king. The result was not favourable, and the archbishop left Harrow for Canterbury, where, very soon after, his brutal murder, committed before the altar of St. Benedict, excited horror throughout Europe. It was at Harrow that Robert de Broc maimed the archbishop's horse,

and the vicar, Nigel de Sackville, was loud in his condemnation of the primate. One of the rectors, William de Bosco, founded a chantry at the church and very richly endowed it; and when Arundel, Archbishop of Canterbury, was impeached for high treason and banished the realm, 1398, Harrow was one of the manors held by him; but in 1543 it was conveyed by Cranmer to the king, and was afterwards given by the king to Lord North, in whose family the manor remained until 1630.

The Vaughan Library and the chapel of Harrow School were then briefly visited, and the company returned to the church. Mr. Waller gave an account of the monumental brasses, which are unusually rich:—

1370. John Flambard and wife, a fine bracket brass.
1390. John Flambard, a single figure.
1442. Simon Marchford, Canon of Salisbury and Windsor, and Rector of Harrow. Head lost.
1450. Three-quarter figure of a priest in an M.A. dress,
1480. John Byrkhede, rector; very fine, but head lost.
1488. George Aynesworth, three wives, and fourteen children.
1574. Dorothye Frankyshe, a palimpsest.
1579. William Wightman and wife (five children lost).
1592. John Lyon and wife, the founder of Harrow School. Moved from original position.
1600. A gentleman and his wife.
1603. John Sonkey, and Alice, his wife.

These brasses are in a very bad condition, some of them loose at the edges; it is much to be wished that something may be done to preserve them.

Harrow Church is a large cruciform structure, with nave and aisles, transepts, a modern north chancel or aisle, and western tower and porches. It had been rebuilt by Lanfranc, but the only Norman portions now remaining are part of the tower and the font. The tower has a western door. with solid tympanum. This door is now blocked, The nave is Early English; the arcade is very fine and bold. The transepts may be of this date also; but the windows are fifteenth-century. The upper part of the spire is also thirteenth-century work. The chancel is fourteenth-century; while the aisles, nave, clearstory, and porch are all subsequent to the fifteenth century. The roof of the nave is very fine. The principals come down on to corbel figures, rather mutilated, representing the Apostles. The corbels on which they stand are carved into grotesque heads. The transept roofs are similar, but without the figures. There is a parvise over the south porch, the entrance being from the church. The font had for a long time served for a flower-vase in some garden. It is of Purbeck. The pulpit is very fine for the period,—oak, about 1708. There is a great curiosity in the shape of the lock, now on the north door, formerly on the south, and its two stupendous keys. There are several monuments, kneeling alabaster figures, and one by Chantrey, commemorating another Dr. Butler, head-master. The south transept serves as a sort of memorial chapel to the head-masters, and there is some very excellent modern glass in some of the windows. In the churchyard is the well-known flat tomb, close to a large elm-tree, on which, as we know from his letters and his poem, Byron used to loll. The view from here is magnificent.

Returning to the King's Head, a cold collation was served, to which ample justice was done. The only toasts were the usual loyal ones, "The London and Middlesex Archæological Society," to which Mr. Alfred White, F.S.A., responded; "The Readers of Papers," for whom Mr. Kershaw answered; and "The Honorary Secretary," to which Mr. George H. Birch replied. Tea was served in the garden, and it was not until the lovely view had almost faded from the sight that the members returned to town, very pleased with the day, for the weather had been very delightful, and the meeting will long be remembered as one of the pleasantest the Society has ever held.

Kersley.—New Wesleyan day and Sunday schools are being erected at Kersley Mount, Kersley. The new buildings are of brick, with stone and blue brick dressings sparingly introduced, the general design being necessarily of a plain character. The plans have been prepared by Mr. Thomas Ormrod, architect, of Town Hall-square, Bolton, and are being carried out under his direction by Mr. John Taylor, builder and contractor, of Farnworth. The cost of the building, according to the present contract, will be about 970*l.*; but the heating, lighting, and furnishing, also boundary-walls, outbuildings, and drainage, &c., will, it is estimated, bring the total expenditure to upwards of 1,300*l.*

THE YARMOUTH MEETING OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.*

As we briefly mentioned last week, Saturday, the 16th, was spent in Yarmouth and its immediate neighbourhood. At half-past nine in the morning the members rallied to the horn of Mr. George Wright, and assembled on the Market Plain, proceeding thence in a body to *St. Nicholas' Church*, where they were received by the Ven. Archdeacon Neville and the Rev. G. Venables. The former delivered a lecture explanatory of the singularity of the form and arrangement of the church, which was founded on the sand-bank formed at the mouths of the Yare. Probably in no important church in England, he said, are the aisles so disproportionate to the size of the nave, and in few churches is an equal opportunity afforded for studying the various styles of architecture which prevailed from the Norman conquest to the Reformation. Herbert de Lozinga, who founded the Cathedral at Norwich, St. Margaret's, Lynn, and St. Mary's, North Elmham, commenced the erection of St. Nicholas' Church in 1101, and it was completed and consecrated in 1119, the year in which he died. Bishop Herbert's church was in the form of a Latin cross. It had a central tower, a nave 101 ft. long and 24 ft. wide, two transepts of the same width as the nave, and a chancel. It has sometimes been asserted that the church had two narrow lean-to aisles, but the ven. archdeacon believed this to be incorrect. All the original building, except Bishop Herbert's central tower, has been swept away by successive alterations. Subsequent additions have been made to Herbert's tower, the core of which remains. On its outer face, on the south, still remains the old Norman arcading with billet moulding. The great wooden piles which formed a foundation to the tower were found, when examined in 1862, to be undecayed and strong as when first driven into the sand nearly 800 years ago. The fact that the tower has remained unaltered has ever since determined the form and character of the church. In less than 100 years the original church had become insufficient for the growing population of the town, and during the reign of Henry I. it was in a great measure rebuilt. The fact that no trace of purely Norman architecture is to be found in the columns of the nave seems to indicate clearly that the earlier nave had no aisles; for, had a Norman line of pillars existed, it is very improbable that they should have been taken down within a century after their erection. It would appear that the outer walls of the nave were removed, and that a new nave of eight bays was constructed, extending westward to its present length. At the same time two narrow lean-to aisles were built, each about 13 ft. in width. According to Sir Gilbert Scott the character of the work exactly agrees with the tradition that the alteration of the church was carried out during the reign of King John. The nave was terminated by a bold doorway, above which was a triplet of lancet windows, and the gable end was flanked by two staircase pinnacles, each 70 ft. in height. The exact length of the chancel of this second church cannot be ascertained, but the first bay of the present chancel, with the respond or western half of the capital of the first pillars, is of the same date as the nave. Within fifty years after the time when the nave was lengthened and the lean-to aisles erected, it was thought necessary again to enlarge the church by building the great aisles, first of the nave, and a few years subsequently of the chancel also. Two causes seem to have led to this—first, the rapid growth of the population, owing to the extension of the fishing trade; and, secondly, the custom of erecting private side chapels which had been introduced, and was probably on the increase. These chapels were either set apart for guilds, by whom the altar, image of patron saint, lights, reliquary, vestments, and communion plate were provided and maintained; or else they were mortuary chapels for which provision was made by legacies or by the care of private families. As many as twenty chapels are said to have been enclosed within the aisles of the nave and chancel. Remains of a chapel at the east end of the south aisle of the nave, and of another at the east end of the south aisle of the chancel, show how richly they were decorated. Traces of wall-painting in the north aisle of the chancel indicate the position of Becket's Chapel. The great aisles, erected in the reign of Henry III., are 40 ft. in width. They brought the church into the three-gabled form, but with the great peculiarity that the side roofs were enormously in excess of that of the nave. Two flanking pinnacles were repeated at the angles of the new aisles, in correspondence with the existing pinnacles of the nave, from an evident desire to bring the western face of the church as far as possible into harmony. One point in connexion with the erection of these aisles has never before been noticed. The new ground enclosed had previously been a churchyard; and just as in former days the builders had no hesitation in removing good work of an earlier date to introduce their own style, so they had not the slighest scruple in making use of stone coffins and monumental slabs as materials for building the enlarged aisle. When, in 1871, a great part of the south-western pinnacle and of the west gable of the south aisle were taken down, because the wall was far out of the perpendicular, no less than thirty of these stones were discovered. The stone coffins had, in some cases, been cut in half, and built bottom upwards into the staircase, so as to form at once a riser and a step. We sometimes dream of the greater reverence paid by our fathers to holy places and holy things; but here was an act which would hardly be sanctioned nowadays by any consistory court or by any chancellor's faculty. It was, probably, the continued desecration of the churchyard which, a few years afterwards, led Sibilla Flatt to erect a carnary or chapel, in which bones, disturbed by recent additions to the church, might be collected and interred. The new aisles of the church are said, by William of Worcester, to have been consecrated in 1251. Probably within thirty years after the building of the aisles of the nave the aisles of the chancel were added. Tradition asserts that these chancel-aisles were consecrated in 1286 by Bishop Middleton. If this be so, the two heads which terminate the dripstone over the eastern window in the north chancel aisle will represent Edward I. and Bishop Middleton. The extension eastward of the chancel was probably of the same date. Coming to the fourth stage in the history of the church, the ven. archdeacon called attention to the fact that the aisle both of the nave and of the chancel have blocked-up windows above the arch of the gable at the point where they meet the transepts. These windows, at one time open, prove that when it was determined to enlarge the aisles, no care was taken at the same time to enlarge the transept, and the effect must have been extraordinary. In the cruciform church the transepts did not extend north and south as far as did the aisles, nor were they equal in height to the great buildings which overshadowed them. Probably this defect was remedied within 1320—1330 by the heightening and extending of the transepts to their present dimensions. Externally they were supported at their angles by flanking turrets; and a very beautiful door, the most perfect in its proportions the church possesses, was opened at the time, or not long afterwards, in the west wall of the south transept. This seems to have been an entrance to an outside chapel, probably connected with the Fastolfe vault. Indications of the original transepts may still be seen in the low arches which open into the aisles of the nave and chancel. The line of carved bosses bearing a series of emblazoned shields, was placed at the intersection of the ribs of the wagon roof during the reign of Edward III. These shields contain the banner of the Holy Trinity, the two-headed eagle of Austria, and the arms of Edward III., of his sons, of the Duke of Bedford, of Thomas of Brotherton, of Bishop Spencer, and of the Norfolk families of Morley, Scales, Fastolfe, Bardolph, Paston, Buckton, and others. In 1330 additional space was again required for the side chapels, and a new extension of the nave and aisles, 47 ft. westward, was commenced and carried up to a considerable height. Two western towers, with a gateway 40 ft. in width, formed part of the design. This work, which was called the "Bachelor's Aisle," progressed but slowly. In 1349 it came to an end in consequence of that terrible pestilence, the Black Death, which carried off 7,052 of the inhabitants of Yarmouth. "The living,' says Manship, "scarce sufficed to bury the dead, much less to proceed with the building." Shortly before the Reformation, that singular wave of church decoration which introduced the Perpendicular style into three-fourths of

* See pp. 917, 936, *ante*.

the churches of England, transformed the windows of the aisles and transepts. At the Reformation the church suffered frightfully. The side chapels were demolished, the plate sold, the rood-loft taken down, and the magnificent reredos of Prior Roger of Haddiscoe was destroyed. In 1551, the sepulchral brasses were sent to London and sold for weights. In 1560, the gravestones were taken out of the churchyard and shipped to Newcastle to be turned into grindstones. During the reign of Elizabeth, the turret of the south aisle of the chancel is said to have fallen and crushed the roof and part of the wall. Wooden windows of the Tudor style were inserted, and these were twenty-five years ago replaced in stone. At the time of the Commonwealth the church was divided into three parts. A brick wall was built across the eastern arches of the tower, and two transepts. The chancel was then assigned to the Independents. A door was cut by them through the canopied tomb of Thomas Crowner, and the seating altered for their accommodation. In 1803 the old spire, 186 ft. in height, was taken down. The present spire was erected in 1806, when an Act of Parliament was obtained enabling the Corporation to levy for the repairs of the church a rate of 1s. per chaldron on all coal imported into the town. A large proportion of the rate on coal was spent in plastering the church. The Bachelor's aisle was taken down to form a foundation for works at the harbour's mouth. Since 1847 many of the disfigurements have been removed, the galleries have been cleared away, the columns of the nave replaced, the chancel arches opened, the chancel restored to its old proportions, the tower strengthened so as to bear a spire of the original height, the south aisle reroofed, and the west front restored; but still much remains to be done before the mutilation of centuries can be effaced, and the church brought back to the splendour which it once possessed.

Cordial thanks were given to Archdeacon Neville for his able paper. Mr. Loftus Brock, F.S.A., pronounced this church to be the most curious he had seen for a long time. It required a fortnight's study. The ground plan shows that the Norman church differed but little from the ordinary plan of a Norman church. If it is true that the lines of three apses are to be found, as has been stated, we have almost the exact plan that was usual. The central tower doubtless shows a cruciform church. But the removal of the Norman nave at the end of the twelfth or the beginning of the thirteenth century is a difficulty. The work at the west end of the nave, called the Bachelor's aisle, has been very much misunderstood. That work, Mr. Brock believes, was intended as a mask to the west front, and to correct the defect of the nave having but a small portion of frontage compared with the aisles, which is an anomaly, and an inversion of the natural order of things. What the architect had in his mind was the construction of a fine bell-tower, similar to that at the west end of Ely Cathedral. People living on low-lying lands have always desired to erect magnificent towers. To correct the proportions of the west end of St. Nicholas, the builder of the Bachelor's aisle intended to carry out a plan not unusual, that of a church with a central tower having a western tower also. The foundations of the Bachelor's aisle, carefully preserved, give the exact square for a campanile. The massive foundations of quadrangular turrets are in proportion to the scale of the tower. If the plan had been carried out there would have been a massive and grand steeple that would have been the glory of the town. Mr. Brock added a few words as to restoration of churches. He recommended an adherence to the golden principle of repairing old work instead of introducing new.

The party, on leaving St. Nicholas Church, visited the residence of Mr. Christmas, Market-road, where they inspected the large and valuable collection of oil paintings, old china, and other rare curiosities that Mr. Christmas is possessed of. This was followed by an examination of the "Rows" and the old Tolhouse.

After luncheon at the Star Hotel, the party proceeded in tramcars to Gorleston, where a visit was paid to St. Andrew's Church. Dr. Bately, one of the churchwardens, read a paper on the building.

In the evening a meeting was held in the Townhall, when Mr. De Gray Birch described the seals and charters of the Corporation, and votes of thanks were accorded to local friends for assistance rendered in making the proceedings successful.

The subsequent three days' proceedings of the Congress were conducted at Norwich, as hereafter detailed.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT NORWICH.

The members of this Association having finished their proceedings in Yarmouth, arrived in Norwich on Monday, the 18th, and were received in the Guildhall by the Mayor (Mr. H. Bullard). After inspecting the Guildhall, the visitors proceeded to the Cathedral, where a paper was read by the Dean (Dr. Goulburn). Norwich Cathedral, the Dean remarked, may be said to have been founded amid the blare of trumpets. In the year preceding its foundation (1095) all Europe had thrilled with excitement as Pope Urban II. had touched the chords of chivalry and fanaticism at Claremont. Not the least notice of this enthusiasm is to be discovered in the letters of Bishop Herbert. They are remarkable for the insight they give into the character of the writer. Herbert de Lozinga was a Lotharingian, educated at Fécamp, in Normandy, who became prior of Ramsey Abbey. It is said that by simoniacal practices he obtained from William Rufus this see, which he removed from Thetford to Norwich, where he laid the foundation of the Cathedral in 1096. He lived, however, to complete only the eastern arm of the church, with its three circular apsidal chapels, two of which remain, the transepts, choir, with the two bays on the west side of the tower, and the south wall of the cloister, with its magnificent Norman arcade. Two other semicircular chapels—one from the north, the other from the south transept—must have been the work of Herbert. The erection of grand buildings was a mania with the Normans. The date of Herbert's church is attested by the basilican arrangement of the east end, which still exhibits the Bishop's stone chair, raised above several steps, and stone benches arranged on either side for the presbyters. Herbert also founded a convent for sixty Benedictine monks. The easternmost of the chapels having been destroyed, was replaced in the thirteenth century by Bishop Suffield, by an Early English lady chapel, of which only the two entrance arches remain. The Registrum Primum, or register of the Prior, shows that Herbert finished the church nearly up to the present screen across the nave, while his successor, Bishop Eborard, completed it. Just on the north of the stone screen was the altar of St. William-in-the-Wood, a lad who was said to have been mockingly crucified by the Jews on Good Friday, and whose body was buried in Thorpe Wood, where it was afterwards miraculously discovered. In the time of Henry III. and Edward I. a dispute arose between the monks and citizens as to the right of the former to take toll on Tombland, when the convent was besieged by the citizens. Most of the conventual buildings were destroyed by fire. Edward I. ordered the citizens to pay 3,000 marks to the Prior for the restoration of the buildings. It is probable that the Ethelbert gate of the Close was then built. The cloisters were built by Richard de Uppenhall, Bishop Wakering, and Bishop Alnwyck, and completed in 1430. The Beauchamp Chapel was founded in 1320. In 1362 a furious hurricane blew down the steeple, and did great damage to the clearstory, whereupon Bishop Percy, with great munificence, rebuilt it in the style of the period. In Bishop Alnwyck's time, about 1430, a Norman west front was removed, and one of a Perpendicular character substituted. Bishop Lyhart (1445-1472) vaulted the roof of the nave, in which he introduced 360 sculptures illustrating sacred history. Bishop Goldwell (1472-1498), who inherited much work from Bishop Lyhart, directed his attention to the roof of the choir, which he vaulted and adorned with his rebus. Bishop Nix, who was a persecutor of the Reformers, completed the roof by erecting the stone vaulting of the transept and adorning it likewise.

Dr. Bensly followed with a paper enumerating and describing a number of curious books and MSS. in the possession of the Dean and Chapter.

After being hospitably entertained at luncheon in the grounds of the Deanery, the party, under the guidance of Mr. R. M. Phipson, visited the grounds of the Bishop's palace, where, over the door of the north transept of the Cathedral, they saw the effigy of a bishop, supposed by some to be that of Herbert de Lozinga, and by others of Eborard. The chapel in the garden, an ivy-covered ruin, and the fine vaulted rooms of the present palace, were visited, and shown by a plan to have been the chapel and parts of the palace of Bishop Salmon. That prelate also built the charnel-house with chapel over it, now used as the Grammar School. Where the dry bones of the dead were deposited the Grammar School boys now disport themselves on wet days in gymnastic exercises. A look at the fine gateway erected by Sir Thomas Erpingham was followed by a visit to St. Andrew's Hall, the monastery of the Blackfriars, of which Sir Thomas was a great benefactor. Between St. Andrew's Hall,—which was the nave, while the Dutch Church was the chancel of the grand church of the Blackfriars,—and the river are extensive remains of the monastery, including the cloisters, now part of the playground of the Commercial School, and other vaulted rooms now part of the kitchen and offices of Mr. Lacey, builder. But the most interesting work near the Hall is a relic of Becket's Chapel, a fragment of brickwork of an early period. On St. Andrew's Hill are the remains of the church of St. Christopher, now part of the premises of Mr. Harman. These were of course noticed. The finest piece of flintwork in the Eastern Counties is said to be the old Bridewell, in Bridewell Alley. It arrested the attention of Evelyn when he came to visit Sir Thomas Browne. St. Andrew's Church, a parochial church second only to St. Peter's Mancroft, was opened to the members of the Association by the Rev. A. C. Copeman. Here Mr. R. F. Beecheno read an interesting paper on the history of the church. There was a church here before the Conquest, but the present one was erected in 1506. Its architecture is Late Perpendicular. The length is 120 ft. and the width 55 ft., being next in size to St. Peter's Mancroft. At the Reformation the parish had a martyr, one Elizabeth Cooper, a pewterer's wife, who suffered death in the Lollard's pit in 1557. She at first recanted openly in the church, but afterwards during divine service called upon the congregation not to follow her example. Within the altar-rails are the brass effigies of a man and woman, supposed by Blomefield to be William Layer, mayor in 1537, and his wife; but Mr. Beecheno found, from Mackerell's MS. in the British Museum, that in his time an escutcheon remained with the mark of Robert Gardiner, mayor, who died in 1508, and whose effigy remains in the north aisle, with the same mark and an inscription. Among the historical features are two specially worthy of note. A mural monument in the south aisle records the fact that the parish of St. Andrew had the honour of giving to the city the first and last mayor under the old charter, viz., William Appleyard, in 1403, and William Moore, in 1834. In the same aisle is also a mural monument to Abraham Lincoln, an ancestor of the late president of the United States. Mr. Lambert pronounced the plate to be the finest in England, and took drawings of it. St. John's Maddermarket Church, which was visited, has monuments of the Howard family,—for in this parish was the ducal palace,—and several interesting brasses. Strangers' Hall, formerly the residence of Canon Dalton, behind the Roman Catholic Church of St. John, is an interesting old mansion built by Nicholas Sotherton. The house has a fine old staircase and a grand panelled room. It was opposite this house that Kemp finished his "Nine Daies Wonder," his dance from London to Norwich. St. Gregory's Church, close by, the next place visited, is interesting for its monuments, its mural painting of St. George and the Dragon, and its lectern.

On Tuesday, the 19th, the members met in the Council Chamber of the Guildhall, where Mr. Phipson pointed out by the aid of maps the ancient boundaries of the city and the sites of the walls and gates. He also gave a description of the various churches, &c.

Mr. De Gray Birch (of the British Museum) called the attention of the members to the charters of the city which were exhibited on the table. He complimented the Corporation on the great care which they had evidently taken of these documents, the series of which formed a most magnificent collection. The members of the Association had often seen documents in a condition the very reverse of these,—tumbled about in confusion, and very

seriously injured beyond reclamation. During the whole time he had been connected with the Association he had never seen a series of documents in a better state of preservation, or more carefully kept than these charters of Norwich. The first charter was of Henry II., and from internal evidence was presumed to have been granted in the fifth year of that monarch. The series might well be contrasted with the unfortunate remains of corporate documents they visited in a town not long ago, where many of the ancient manuscripts had been allowed to fall under the hammer of the auctioneer. But, as an officer of the British Museum, he ought to speak with hesitation on this point, because if such documents did not sometimes get out of their proper ownership, the British Museum would not be able to gather together such a collection as it had. The seal attached to the charter of Henry III. was a remarkable example of the seal of the period; it was appended to the charter by a fine specimen of the weaver's art, composed of a silk facing on a ground of worsted or thread. These were some of the oldest remains of the weaver's art now to be found, and he doubted whether it could be reproduced in the present day.

The visitors then proceeded to visit some of the city churches. St. Peter's Mancroft was the first seen. It is of the Perpendicular period, and is a well-known example. St. Stephen's Church, which was erected after the Reformation, was next visited. It contains some elegant tracery, some fine painted glass, and several interesting monuments. Other objects of interest in the church having been noticed, the party proceeded to Heigham, to the flint-faced house, the Dolphin Inn, the home of Bishop Hall. Over the ornamented doorway is the date "1587." In the wall just within the door is a piscina, and a wall bench-end of the fourteenth century projects from the old stairway. The principal room of the house has wood panelled ornamental walls, oak doors, and an elaborately plastered ceiling, all of the Jacobean period. Bishop Hall, who died on September 6th, 1656, lies buried in the recently-restored church of St. Bartholomew close by, where there is a curious monument to his memory.

In the afternoon the members proceeded to Arminghall, where they inspected a fine old Elizabethan house, now divided into two dwellings for workpeople. Cotman mentions a tradition that some of the materials used in this house were brought from Carrow Abbey. Over the doorway is a sunk panel filled with the sculpture of a man pulled off his horse by a lion. On their way back from Arminghall the excursionists visited Carrow Abbey, the residence of Mr. J. H. Tillett, who gave them a very cordial welcome and full liberty to make a thorough examination of the house and grounds. Mr. E. A. Tillett, who some years ago traced out the plan of the church and buildings of the nunnery in continuous ridges of ground in a meadow at the back of the Abbey, took Mr. Loftus Brock and other gentlemen the whole circuit of the convent lands, nearly ten acres. Mr. Brock confirmed Mr. E. A. Tillett's conjectures as to the situation of the church, the churchyard, and the buildings of the nunnery. Mr. J. H. Tillett then read some notes on the history of the Abbey. On the return of the party to Norwich, a few gentlemen explored the old Norman crypts in King-street, and noted the remains of Saxon and Norman architecture in the churches of St. Julian and St. Etheldred.

An evening meeting was held in the Guildhall, when an interesting paper on "The Place Names in Norfolk," was read by Mr. Picton, who pointed out how the local nomenclature of any district is generally calculated to throw light on the succession of races by which the country has been inhabited, the circumstances of their settlement, the languages which they spoke, and the incidents of their history. Norfolk was not inferior in interest to any other part of England. The names of its rivers are Celtic, and that the Angles gave names to many of its villages is shown by such terminations as "ham," "ton," "ing," &c., whilst similar evidence respecting the Danes was afforded by terminations like "by," "thorpe," "stead," &c. In the course of his paper Mr. Picton remarked that there are evidences of the ancient Saxon mark in Norfolk. —A brief discussion followed, in the course of which Mr. M. Knight referred to Markshall as a place which retained the very name of the Mark, and to the Town Close Estate as being part of the ancient mark lands of the burgh. Papers were also read by Mr. Knight on "Norwich as the Venta Icenorum," and by Mr. J. Gunn on "The Trinitarian Form of Norwich Cathedral." The corporation plate was displayed at this meeting, and discoursed upon by Mr. Lambert.

On the concluding day, Wednesday, the 20th, there was a carriage excursion, in conjunction with the Norfolk and Norwich Association, to Burgh, near Aylsham, Sall, and Cawston, taking in *en route*, by the invitation of the Marchioness of Lothian, Blickley-hall. About half-past ten the vehicles being all occupied, the party commenced their journey, first making for Burgh, near Aylsham, by way of Catton, Spixworth, and Buxton. On entering the church at Burgh, which is dedicated to St. Mary-the-Virgin, the attention of the party was at once attracted to the restored chancel which, as Sir Gilbert Scott says, "is one of peculiar interest," having on the south side "a continuous range of beautiful lancet lights arcaded within and absolutely simple without." Below is an arcade upon stone seats. Mr. Phipson gave some interesting information both with respect to the township and the church. Soon after one o'clock the party arrived at Blickling-hall, where they were received by the Marchioness of Lothian, and hospitably entertained at luncheon. The company afterwards made an inspection of the house, conducted by the Rev. F. Meyrick, rector of Blickling and Erpingham, who gave some interesting details respecting the house itself, the persons who have lived in it, and some of the books and pictures it contains. The party next proceeded to Blickling Church, which is of the Perpendicular period, and contains several old brasses, the most remarkable being one to Sir Nicholas Dagworth, concerning whose career Mr. Spaul, of Norwich, contributed some interesting notes. Re-entering their carriages, the party next went to Sall Church, which is one of the finest of the Perpendicular churches to be found in Norfolk. It consists of chancel, nave, aisles, transepts, with a south porch and parvise, and has a fine west door with angels in the spandrels. The church was built in the time of Henry VI., probably by the De Brews, Mautebys, Morleys, and Kerdistons, whose arms occur upon it. Parts of the arms of the Wingfields and De la Poles occur in various parts of the church. A portion of the fine old painted roof, very similar to that at Blythburgh, remains. A rood-screen, which has been sawn in two, and the upper parts utilised in the formation of pews, was enriched with paintings of saints, as may be seen on removing the whitewash or paint which has been thickly spread over them. There are some misereres with elegant carvings. The church is reported to be in a bad condition, and to need attention. Cawston Church, subsequently visited, was built by Michael de la Pole, Earl of Suffolk, and is a fine example of the Transition period from Decorated to Perpendicular. Its massive tower, in the opinion of Mr. Phipson, by whom both churches were described, was never completed by the putting on of the parapets. The principal features in the interior are the hammer-beam roof with the spandrels filled with tracery and angels at the ends; the almost perfect rood-screen, its panels filled with paintings of the Apostles, the Fathers, and Sir John Shore; and its singular oak-screen across the tower arch, on which runs the legend, "God speed the plow, and send us ale enow our purpose for to make, at the sign of the Plow leet in Sygate. Be merry and glad; what good ale this work made." It is supposed that this has reference to the ancient custom of the blessing of the plough on Plough Monday, or to some old manorial usage.

In the evening the party returned to the Royal Hotel, where they had dinner and an evening sitting, under the presidency of Mr. J. J. Colman, M.P. A paper contributed by Dr. Jessopp was read on the Grammar School House, in which it was endeavoured to prove that Bishop Salmon built the house, and that it is the oldest in Norwich; but Mr. Phipson, in commenting upon the paper, doubted the success of Dr. Jessopp's efforts in this direction.

The thanks of the Association were given to Mr. Colman, who, in reply, expressed a hope that it would not be long before the Association came to Norwich to explore more thoroughly its places of architectural and historic interest. The thanks of the Association were next given to Mr. Phipson, and to the local gentlemen who had read papers, and had made the visit more successful and enjoyable by imparting interesting information relative to places of note. Mr. Loftus Brock proposed a vote of thanks to the mayor, magistrates, and corporation of Norwich, and also joined in the hope that before long the Association would again visit "that charming old city."—Mr. Fitch having acknowledged the compliment, a hearty vote of thanks was tendered to Mr. Geo. Wright, the Excursion secretary, on the motion of Mr. Phipson, and this brought the congress to an end.

SUBTERRANEAN TELEGRAPHS IN GERMANY.

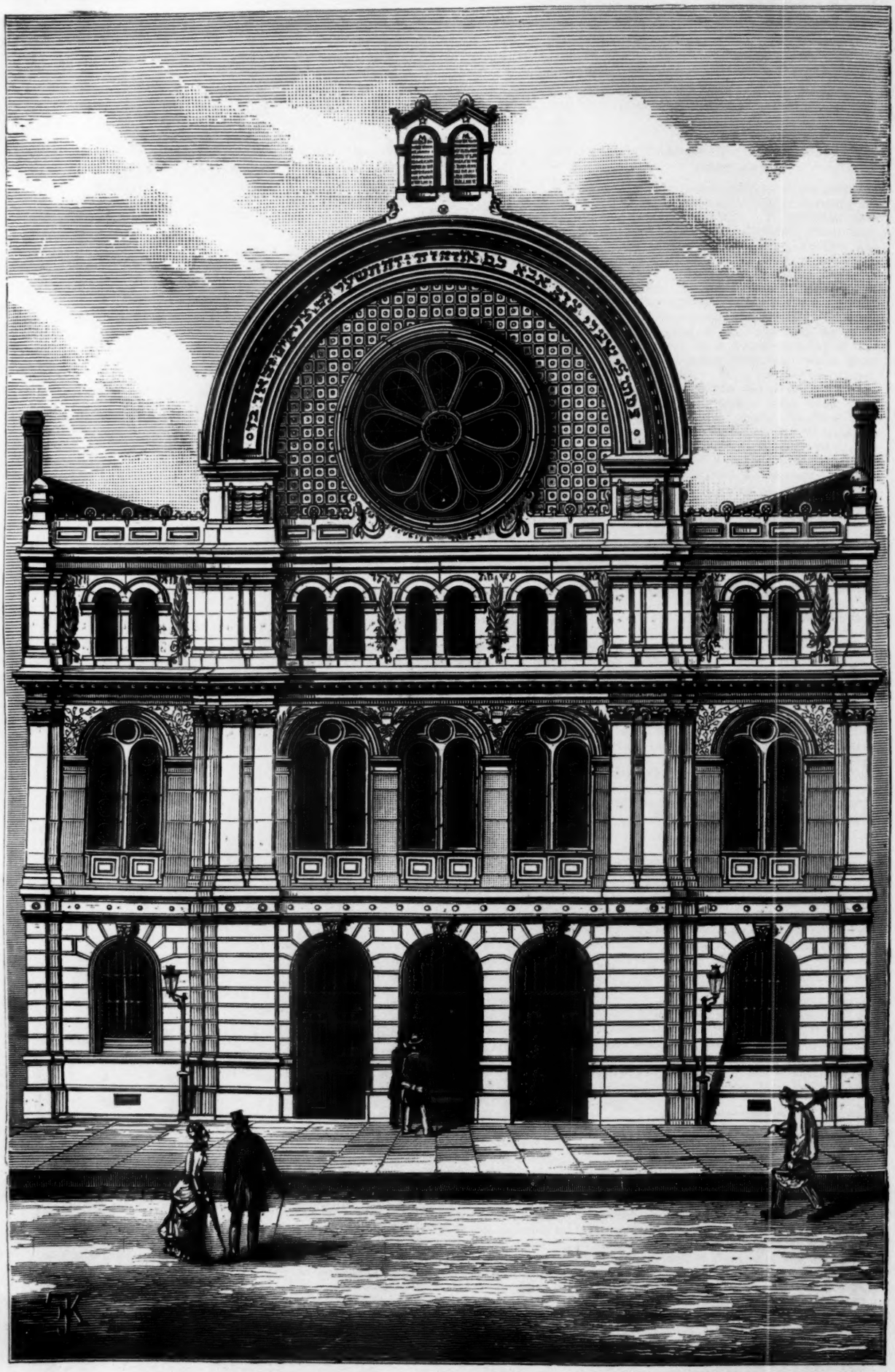
Several important additions to the extensive network of subterranean cables in Germany are in course of construction. Preparations have been made for immediately laying down three cables from Berlin, to Dresden, Breslau, and Stettin, respectively. The seven-wired cables are supplied by Messrs. Guillaume & Velten, of Cologne, and Messrs. Siemens & Halske, of Berlin. The splicing, the most difficult part of the work, will now be done by German workmen. The laying of the cable from Berlin to Halle, described in a former number of the *Builder*, offered many difficulties, which have now been overcome. It is possible now to lay, splice, and imbed in one day as many pieces of cable as it formerly took a week to do. The manipulation has been greatly simplified by a machine invented by Dr. Siemens. This machine, driven by steam, excavates, as it proceeds, the road to a depth of 3 ft., and a breadth of 10 inches, depositing behind, at the same time, the cable into the ditch prepared by it in front; workmen follow, and rapidly fill up the trench and beat the ground firm. In submerging cables in rivers, also, practice has contrived manipulations by which much time is saved. The cable from Berlin to Dresden will be continued at some future time, over Hof and Nürnberg, to München; that to Breslau will receive an extension as far as Oderberg, with a branch to Posen; and the cable to Stettin will be extended, over Köslin, Schlawe, Stolp, and Lauenburg, as far as Danzig and ultimately Königsberg. When once the cables from the centre Berlin above indicated are completed, it will only require a few junctions in order to perfect the network all over Germany. The empire will then possess a system of telegraphic communication entirely independent of the vicissitudes of the elements. If we look on Germany as a circle, the centre, Berlin, will send cable radii to Königsberg, Strassburg-Metz, Oderberg, Hamburg-Kiel, Magdeburg-Cologne, and Dresden-München. A work of the future will be a cable periphery covering all the frontiers of the German Empire.

THE JEWISH SYNAGOGUE, RUE DES TOURNELLES, PARIS.

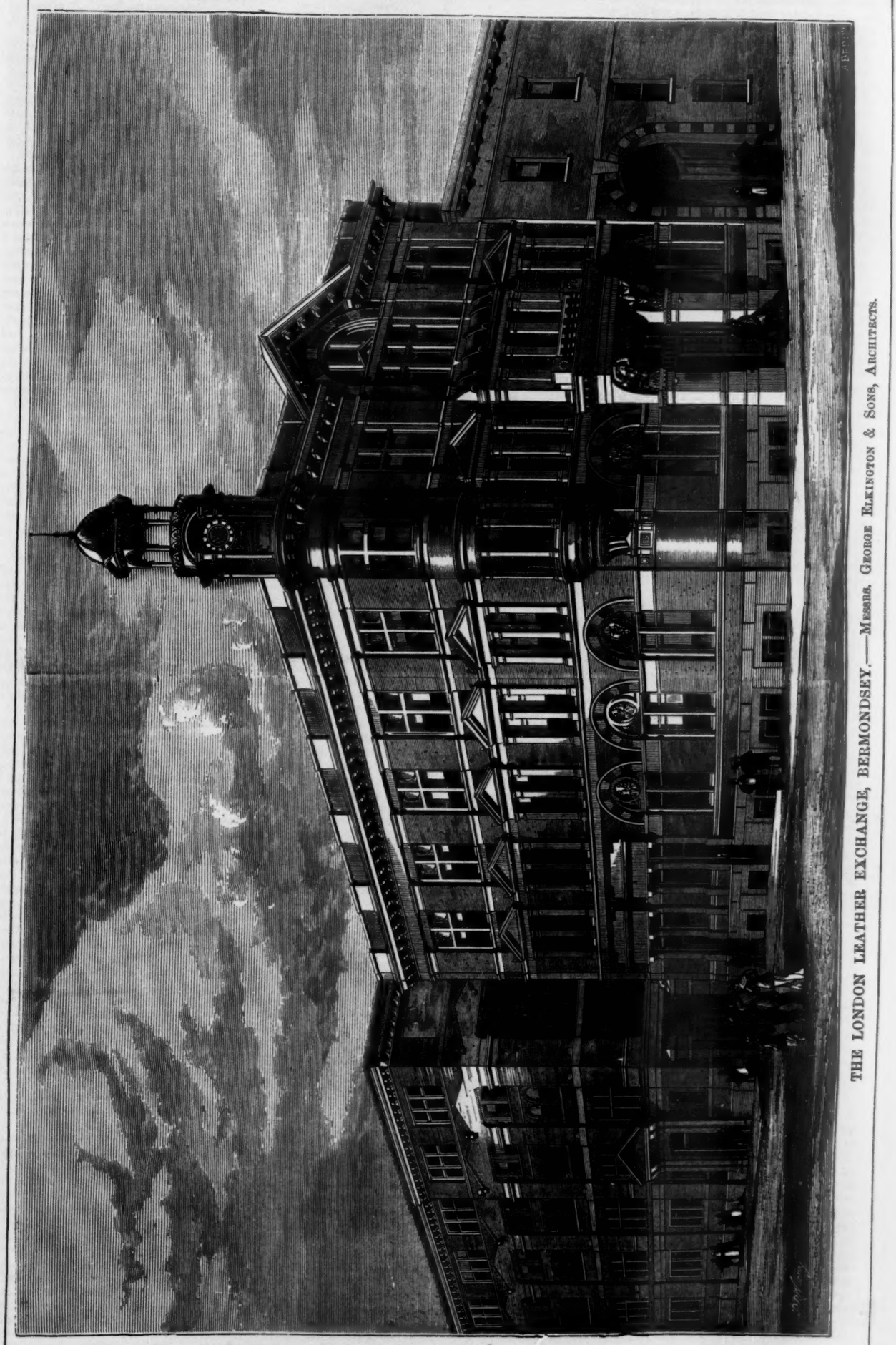
We have already given an interior view of the new synagogue recently erected in Paris, with a few descriptive particulars, and we add now, according to promise, a view of the exterior.* We may repeat, for the sake of convenience, that the façade measures 22 mètres in extent; is decorated with sculptured emblems of the Jewish faith, such as branches of palm, sacred trumpets, as also Hebrew inscriptions; and is surmounted by a semicircular frontal, at the top of which are placed the tables of the law. The sculpture was executed by MM. Germain and Watrinelle. M. Varcollier, official architect for the Fourth Arrondissement of Paris, designed the building.

Bridges for the Suburbs.—At the meeting of the Metropolitan Board of Works on the 8th inst., on the motion of Mr. Dresser-Rogers (for the Works, &c., Committee), seconded by Mr. Lloyd, the Board approved of the drawings submitted by the Lewisham and Plumstead District Boards, of a bridge proposed to be constructed over the river Quaggy, and agreed to contribute one-half of the cost of the work, not exceeding 300*l*. A report was also submitted by the Works and General Purposes Committee, recommending that the Board do contribute one-half of the cost of the construction of a new bridge over the river Lea at Temple Mills, and of improvements to the two bridges passing over the Hackney-cut, such contribution not to exceed in the aggregate the sum of 2,550*l*. The report was adopted.

* See pp. 858, 859, *ante*.



EXTERIOR OF THE JEWISH SYNAGOGUE, RUE DES TOURNELLES, PARIS.——M. Varcollier, Architect.



THE LONDON LEATHER EXCHANGE, BERMONDSEY.—Messrs. George Elkington & Sons, Architects.

THE LONDON LEATHER EXCHANGE, BERMONDSEY.

The building at the corner of Weston-street and Market-street, Bermondsey, immediately adjacent to the Leather and Skin Market, belongs to the Leather Warehouse Company, and has been recently erected to supply the recognised want of a suitable place which should be regarded as the head-quarters of the leather trades in London. It was formally opened on Wednesday, the 13th inst.

The manufacture of leather has been carried on in England from a remote date, this useful product having been mentioned as an export in the time of Augustus. It is difficult to state when the manufacture became localised in Bermondsey, but certainly soon after the Norman Conquest tanners were found there. The natural character of the locality, which consisted until the last century of low marshes intersected by tidal streams, marked out this portion of Southwark as the obvious seat of a manufacture for which considerable space and abundant supply of running water were essential. There are several important factories which still possess the right of tidal water supply from the river Thames, the regulations and control of the culverts being vested in the local authorities.

In the time of Edward III. it was enacted that all leather, skins, wool, &c., for export, should be sent out from a staple town or port, London being one of the chief. The earliest market for leather appears to have been held at or near the Guildhall, in the City, afterwards removed to Leadenhall in 1444, and in 1488 the Court of Common Council made an ordinance that the assay of tanned leather was to be made at Leadenhall, the position of which as a market is thereby confirmed.

In the reign of James I., 1604, the great Statute of Leather was passed, the salutary effects of which exist to the present time. That Act provided for the classification and regulation of the various trades concerned in the production of leather; confirmed the London right of search and assay; regulated Leadenhall; recognised Southwark market and Bartholomew Fair as places for the sale of leather; and broke down the monopoly which previously restricted dealing in leather to citizens of the City of London.*

In 1831 the Leather Warehouse Company was formed, and the market established at Bermondsey on a site containing several acres. Nine warehouses, with hide depository, tavern, &c., were erected under the superintendence of the late Mr. G. Porter, and several additional warehouses have been built by the company since that period.

The dismarketing of Leadenhall market by the Corporation of London, and the consequent removal of leading factors and merchants connected with the leather trade to Bermondsey, have induced the directors of the company to erect the new Exchange and Mart in the very heart of the trade. The building is faced externally with red bricks and Portland stone, the plinth being of Haytor granite. Two carved figures—one on each side of the principal entrance — assist in supporting the balcony in front of the bay window on the first floor. The carved medallions on the semicircular heads of the ground-floor windows represent various processes of leather manufacture. The clock, in the turret at the angle of the principal fronts, strikes the hours on a bell in the open turret above.

The principal portion of the ground floor is occupied by the Exchange, 46 ft. by 40 ft. and 14 ft. 2 in. high; adjoining is a business room with luncheon bar for members only.

A broad staircase leads to the first floor, 13 ft. high, on which are separate dining-rooms for members and non-subscribers, servery and dinner lift, and butler's pantry. The first floor also contains reading-room, 26 ft. by 17 ft. 9 in., smoking-room, and extensive lavatories, &c., for members.

On the second floor is a sale-room, available also for public meetings, 46 ft. by 40 ft., and 13 ft. high, having a semicircular ceiling with continuous skylights over the centre portion, which is 20 ft. in extreme height.

Two private rooms connected with the sale-room and the manager's apartments, complete this story.

On the basement are the kitchen, scullery, larder, pantries, store-rooms, wine, spirit, beer, and coal cellars.

The rear portion of the building on the basement and ground floor is appropriated to the business of the Leather Market Tavern, formerly carried on on this site.

Internally the walls are pointed, the woodwork stained and varnished, the lobbies and vestibules being paved with Minton's tiles. The public rooms are heated by hot-water pipes and coils supplied by Messrs. J. Weeks & Co. The works have been carried out from the designs, and under the superintendence of Messrs. Geo. Elkington & Son, of Cannon-street, architects to the company. The builder is Mr. Wm. Shepherd, of 101, Bermondsey New-road. Messrs. Strode & Co. have carried out the gas-fittings, and Mr. John Warne the bar and counter fittings. The restaurant department is in the hands of Messrs. Roberts, of St. James's Hall.

* The recently-published "Index to the Remembrancia," reviewed in our last issue, gives an account of a number of letters referring to the early history of the leather trade.

NEW HIDE AND SKIN MARKET, EASTCROFT, NOTTINGHAM.

In connexion with the account we give above of the London Leather Exchange, we have to mention the recent completion of the Hide and Skin Market, Eastcroft, Nottingham, under the directions of Mr. S. Dutton Walker, architect. The buiders were Messrs. Lees, Brothers. The style adopted is a variation of Gothic. The building covers an area of 120 square feet. The terra-cotta of the Whitwick Colliery Company is freely used. Entering by one of the wide archways on the north side, we find ourselves in a large open shed that one might take to be a modern railway station, the iron pillars supporting the roof and the light iron framework above favouring such a supposition. One side of the interior is intended for sheep skins and another for hides, and wooden benches on the south side have been erected for the fat "market." The floor on which the skins will be deposited is, of course, slanting, and is made of a hard brick specially adapted for the purpose, whilst the walls are of white enamelled bricks, which may be readily washed after the market has been held. The ventilation is on what is known as the louvre system; and, the light being admitted from the north side, little or no sunshine will enter, this being an especial desideratum. To the right of the building, as you enter from the north, are situated various offices. There is stabling capable of accommodating six horses (the floor is of a new kind of brick, which, as the grooves only run in one direction, may be easily swept); there is, further, a harness-room, salt store, and a yard suitable for grooming the horses. The business offices are placed on the north side, immediately as you enter. There is an entry department and a general office, and above these a sale-room and board-room, the whole suite of rooms being comfortably fitted up and heated by hot-water pipes. The market is built by the Bridge Committee, and let on lease to the Nottingham Hide, Skin, and Fat Market Company, Limited.*

* A small view, and a plan of the market will be found in the *Leather Trades' Circular* for June 7th, 1879.

THE SHEFFIELD MEETING OF THE BRITISH ASSOCIATION.

The annual meeting of the British Association for the Advancement of Science commenced in Sheffield on the 20th inst., under the presidency of Dr. Allman. We give abstracts of a few of the papers read in the sectional meetings.

In Section C, Geology, Professor Boyd Dawkins, F.R.S., gave an account of the discoveries in the bone caves of Derbyshire. The first cavern brought to light in Derbyshire, he said, was the famous one of Wirksworth, about 1820, accidentally come upon in the working of a lead mine. The finding in it of the remains of elephants, an almost perfect skeleton of the rhinoceros, and other remains of the same animal, alone established the fact of the existence of these animals in that part of the world in olden days. In 1875 Mr. Mello found, in the caves of Cresswell Crags, bones of animals and remains of men's handiwork. The last cavern that had been explored was discovered at Matlock Bath this year, and the remains of animals found were of the same sort as those met with in Cresswell Crags. The next and most important thing they would like to see settled was the age of these caverns, but that he looked upon as an impossibility. There was nothing to show that they existed before or during the Glacial period; and all the attempts that had been made to fix a date, outside the written record in the pages of the historian, he looked upon as useless, because they put before the minds of people who did not know a certain amount of definiteness with regard to geological events which those events did not possess.

The President of the Anthropological Department of Section D, Biology, was Dr. E. B. Tylor, F.R.S., who, in the course of his address, asked what, looking back 4,000 or 5,000 years, was the appearance of mankind as disclosed to us by the Egyptian monuments and inscriptions? Several of the best marked races of men were already in existence, including the brown Egyptian, the dark white Semitic man of Assyria or Palestine, and the Central African of two varieties, which travellers still found as distinct as ever. The evidence accessible as to ancient races of men went to prove that the causes which brought about the difference in types of skull, hair, skin, and constitution did their chief work in times before history began. Experience and history showed that civilisation grew up gradually, while every age preserved recognisable traces of the ages which went before. The woodman's axe of to-day still retained much of the form of its ancestor—the stone celt in its wooden handle. The monuments showed that in the Egyptian life 5,000 years ago civilisation had advanced so far that there was an elaborate form of government, an educated literary priesthood, a nation skilled in agriculture, architecture, and metal work. There appeared no particular reason to think that the relics from the drift-beds or bone-caves represented man as he first appeared on the earth. The savage condition generally, though rude, and more or less representing early stages of culture, never looked absolutely primitive, just as no savage language ever had the appearance of being a primitive language.

In the same section, Dr. Phené, F.S.A., read a paper "On the Discovery of Animal Mounds in the Pyrenees." The present discovery was very greatly due to the description given by Sir Vincent Eyre of a custom of burning living serpents at a particular spot in the Pyrenees. In exploring these mountains, the author found in certain directions indications which always accompany the mounds. The churches abounded in features expressive of the subversion of a pagan faith, of which the serpent or dragon had evidently been the representative, and with these were found built into the walls examples of pagan Roman occupation, as votive altars, &c. Following the track where these were most expressive, he had come upon mounds as distinct in form to an animal appearance as that presented by any of the American mounds; they were altogether artificial, and shaped into an appearance of animal outline so real as to seem like life. In the parts forming the heads the chamber had been appropriated, in one case by an arched chamber of Roman work, in another by a descent of several feet into the body of a small church. On the spine of the least molested one had been a tumulus, in which, the curé of the church informed him, had been found several of the most primitive incinerary urns, containing bones, Celtic articles, and above these, objects of the Gallo-Romano description, and again above these, later or Christian Roman works. One of the most interesting of the latter had been laid aside, and the curé sought it out for Dr. Phené amongst some *débris*; it was the stem of an ancient cross, and on it were sculptured serpents—not in the usual position of subjection to a superior power, but evidently as being in a condition of supremacy; but as there were also several dead ones represented, it might be that the sculpture figured the condition of the real serpents before and after the ceremony of burning. Everything in the district was emblematic of the serpent or dragon, and the mounds were distinctly of such a form. On the mountains overlooking these mounds were a number of stone circles, like those so well known in Britain. The description of these and further details he reserved, to meet a request made by the representatives of the American Congress at Brussels, before which he had been invited to read a paper on the mounds of Europe. In this last discovery he had the advantage of having some members of the British Archæological Association present with him, who also identified the exact resemblance of the mounds with life-like animal forms.

In Section E, Geography, a paper on the Imperial Survey of India, by Mr. J. O. N. James, Deputy-Superintendent of the Surveys of India, was read by Mr. Black. The object of Mr. James's paper was to sketch out in a concise manner the nature of the work in progress and already performed by the Indian Survey Department, and to point out its practical utility. The Imperial Survey of India, up to a late period, consisted of three distinct branches, namely, the Trigonometrical, Topographical, and Revenue Surveys. The Trigonometrical Survey, besides its purely scientific work, furnishes the great basis by principal triangulation for the origin and extension of detail surveys executed by the Topographical and Revenue branches. Already the whole of India is covered with principal triangulation which, for scientific accuracy, is unsurpassed by any similar undertaking in the world. To the Topographical branch is assigned the labour of executing geographical surveys of native States and hilly or forest tracks in British territory, usually on a scale of 1 in. to the mile. Mr. James described the methods adopted in the execution of these topographical surveys, and pointed out the vast amount of geographical information which is collected by the surveyors. During the administration of Sir Henry Thuillier, late Surveyor-General of India (1861 to 1877), an area of not less than 290,000 square miles was surveyed and mapped, including the wildest and least known tracts of India. This enormous area, more than double the size of Great Britain and Ireland, was surveyed in sixteen years, at an average cost of 2*l.* the square mile. The Revenue Survey operations, the paper said, are chiefly confined to open and well-cultivated districts in British territory. They furnish complete and accurate records of the area and boundaries of every village and district; they show the extent of waste and cultivated land, the nature of the soil, and the principal features of the country, on a scale of 4 in. to the mile. From these original surveys excellent maps of complete districts are completed on various scales for general administrative purposes. In some special districts the system of cadastral field surveys has been introduced. During Sir Henry Thuillier's superintendence, an area of 493,000 square miles was completed on the village survey system on a scale of 4 in. to the mile, and 12,281 square miles by cadastral measurement on a scale of 16 in. and 32 in. to the mile, making an aggregate of 505,574 square miles, considerably more than double the area of France. The Revenue Surveys comprise a great portion of Bengal and Assam, all Oude, part of the north-west and central provinces and Bombay, nearly all the Punjaub, and all Scinde. This work has not been accomplished without the sacrifice of many valuable lives and the necessity of facing dangers and hardships of no common kind. The zeal and devotion of the Indian surveyors are beyond all praise, and their work has been and continues to be most valuable. It must, however, be clearly understood that a considerable portion of what has been accomplished by the Topographical branch of the Department is nothing more than a first survey, rapidly executed, for geographical and general administrative purposes. Hereafter, more rigorously accurate and complete surveys will be needed.

In Section F, Economic Science, Professor Leone Levi read a paper on the "Scientific Societies in Relation to the Advancement of Science in the United Kingdom." He enumerated the existing scientific societies in the United Kingdom, stating their present numbers and the functions they discharged. First and foremost were the three Royal Societies—one in England, one in Scotland, and one in Ireland, the number of members in 1878 being for the Royal Society, 549; the Royal Society of Edinburgh, 428; and the Royal Irish Academy, 328. The societies devoted to physical and mathematical sciences had, in 1878, 5,406 members; the natural history sciences, 16,534; the archæological and geographical societies, 5,038; and the societies whose object is the study of the applied sciences, 21,947. The amount voted by the State yearly for education, science, and art appeared large, and constituted a somewhat greater percentage on the total national expenditure than in former years. Thus, in 1878, the total expenditure was 85,408,000*l.*, and the expenditure for education, science, and art, 4,153,000*l.*, or 4·88 per cent. If, however, we eliminate from the total vote the amount expended for elementary education, the proportion left for science and art is considerably diminished, amounting only to 529,000*l.* The income of our scientific societies ordinarily arises from annual subscriptions or life subscriptions of members, and from the proceeds of any funded property. Some of the societies were indifferently located, and their house-rent constituted an appreciable proportion of their expenditure. Dr. Siemens, the president of the Iron and Steel Institute, had offered 10,000*l.* towards the erection of a suitable building for the accommodation of the various societies representing the applied sciences in the metropolis. It was to be hoped several societies might see their way to combine for such a purpose, and it would not be too much to expect that her Majesty's Government may, if applied to, be willing to grant at least a site for such a building. Professor Levi went on to say that it was not to be desired that our scientific societies should be subsidised by the State, but the claim of science to State assistance had been so fully recognised that they might well demand that whatever amount is so devoted should be fairly distributed among all branches of science.

In the same Section, Professor Silvanus P. Thompson read a paper on "The Apprenticeship Schools in France," and claimed to have established by facts drawn from the experience of French schools—first, that the systematic instruction of apprentices in the skilled industries is possible; secondly, that it can be effected in several different ways; thirdly, that apprenticeship schools of one or other type afford a most satisfactory and economically sound way of attaining this result; and, fourthly, that this new apprenticeship solves the knotty problem of technical education which arose out of the decay of the old apprenticeship.

Section G, Mechanical Science, was presided over by Mr. J. Robinson, president of the Institution of Mechanical Engineers, who took for the subject of his address "The Development of the Use of Steel during the last Forty Years, considered in its Mechanical and Economic Aspects." In the course of it he said:—As the use of this material is perpetually growing more common, so are discussions as to its manufacture, composition, and characteristics becoming almost wearisome from their frequency. At the time when railway extension was becoming general, about forty years ago, the use of steel in this country was confined mainly to tools for mechanical purposes, including files and other articles, springs for vehicles, weapons of various sorts, and implements for agricultural and domestic uses; and it is proposed to measure the scientific and mechanical energy brought to bear upon the manufacture and improvement of this metal by the increase in the number of purposes to which it is applied, and the diminished price at which it can be obtained, as compared with the price at the time of its introduction for constructive works. There are, however, several important exceptions to this method of appreciation to which reference will hereafter be made. Mr. Robinson then referred in detail to the reduction of prices of steel, and asked, To what do we owe this enormous reduction of price and consequent more frequent and more economic application? "The answer must be that, following the initiation of Krupp, our English engineers and men of science set themselves to work to discover and apply new processes for the production and manufacture of this most wonderful metal; and I venture to say that, in the whole history of metallurgy, from the time of Tubal Cain downwards, there has been no such progress in invention and manufacture as has been realised by the aid of such men as Mushet, Krupp, Bessemer, Siemens, Whitworth, Martin, Vickers, Bell, Bauschinger, Styffe, and many others within the period comprised in this retrospect; and our national predilections will perhaps lead us to the opinion that our own country may fairly appropriate a large share of merit for the results achieved. Another of the uses of steel to which attention may be given is that of the production of cannon of large size. Efforts had been made by some of our enterprising workers in metal to produce large guns of solid wrought iron; but the processes of heating and hammering were attended with so much difficulty that the attempt was given up. Here, again, Krupp stepped in, and succeeded, thirty-two years ago, in manufacturing cannon of cast steel, which unhappily have become ordinary commodities with those nationalities who can afford such expensive weapons. Since that time Krupp has produced about 2,000 guns, the heaviest being, when finished, 72 tons (16 in.)." After enlarging on the different processes, he said that the use of steel will be still further extended and its price reduced mainly by means of the methodical researches of our scientific metallurgists.

In the same section, Mr. Baldwin Latham read a paper on "The Temperature of Town Water Supply," and pointed out that any increase in the temperature beyond 55° rendered water very unwholesome. The author in this paper drew attention to the fact that the temperature of the water supply of a town, as furnished by public waterworks, was totally independent of the temperature of the water at its source of supply, and that invariably the temperature of the water was the temperature of the ground, at any season of the year, at the depth at which the distributing mains were laid. While the temperature in the chalk-wells at Croydon gave an average monthly range, based upon daily observations, of 0·64°, the same water, when supplied direct from the mains, gave an average monthly range of 21·14°, or when stored in a cistern a range of 28·05°; while water supplied from the Thames in Westminster gave an average monthly range of 24·69°. But the average yearly difference of temperature between the chalk-water supplied at Croydon and the Thames water supplied in Westminster was only 0·67°.

Mr. J. Oldham asked whether Mr. Latham could tell the various temperatures in artesian wells from 1,400 ft. to 1,800 ft.

Mr. Latham said that he had made a very large number of observations, and he found that the temperature of the overflowing wells at Wandsworth was about 50½°. The temperature of the water in wells varied greatly. In some of the deepest wells the temperature was lower than in the shallow wells. The movement of the water through the strata of itself increased the temperature.

Mr. J. W. L. Glaisher said that, having long been connected with the Registrar-General's Office, he had frequently had to take the temperature of the Thames water. It had long been recognised as a fact that cholera or diarrhœa never showed itself to any great extent until the Thames water reached 62°. It stood to reason that when the waterpipes were of small diameter, and were near the surface, the water partook of the temperature of the surroundings. He was in favour of having a much larger diameter of supply-pipes. Water at a depth of 50 ft. or 60 ft. differed very little from the climate; but at a depth of several hundred feet the temperature was higher.

Captain Galton said that the water-pipes should, as much as possible, be kept below the ground. The statements which had been made were a strong argument in favour of the abolition of cisterns and in favour of a standing water supply.

MR. GLADSTONE AND AMERICA.

Sir,—The speech made by Mr. Gladstone at Chester would have carried weight with a much larger proportion of thoughtful people if he had confined himself to the expression of his warm opinion regarding the value of superior education to the manufacturer, and especially that kind of education which leads to a knowledge of men and their actions combined with as high a technical education as the state of modern science can afford.

Had Mr. Gladstone confined himself to the expression of his belief that English commerce must still suffer by the competition of countries like France, Germany, America, and Belgium, where the workmen are all but sufficiently educated, we should have received from Mr. Gladstone a valuable addition to our authoritative opinion on the subject; but we cannot so fully accept his views as to what constitutes "taste," defining it as "nothing in the world except the faculty which devises according to lines of beauty, executes according to lines of beauty, and judges according to lines of beauty."

Mr. Gladstone is unhappy also, we are forced to consider, in his attempts to compliment the Americans, and he is severe when he censures them for not having in any of their manufactures succeeded as yet in producing anything that is beautiful. American manufacturers have been the first commercial workers to see the value of the theory that construction must precede decoration; and there can be no doubt that American manufacturers are at this period exceedingly forward in their march towards that ever-receding perfection that will give America,

in common with the rest of the world, enough work in the direction of art to satisfy the most laborious for a century at least.

America is producing at the present time many objects of widely-extended commercial value, that owe much of their claim for success to their artistic beauty, and this beauty is arrived at by the simplest possible process,—that of the practical, judicious exercise of capital in the hands of tolerably educated manufacturers, who, contrary to the English opinion of the American, are so wholesomely free from prejudice as to seek for skill such as they require, not merely in their own country, but in London or Birmingham, in Paris or Lyons, in Yokohama or Liège, and from almost every town of any consequence of unhappy but still educated Germany.

There cannot be a doubt as to the importance of continuing to establish well-conducted schools of art throughout England; but it is a sad statement to have to reflect upon which Mr. Poynter has allowed to appear in a corrected version of one of his lectures, that England can only rely on foreign training and teachers for its hope of obtaining artistic eminence. Surely Mr. Poynter considers himself as well able to teach as those foreign gentlemen whom he recommends to us, and certainly he must admit that the technical and mechanical methods which undoubtedly many foreign workmen excel in, are not difficult of communication, through processes slightly less complicated than those involved in the establishment of a Conservatoire, or even of the more intricate paraphernalia of a Royal Academy.

A very ordinary manufacturer who has perfected his machinery, it may be to carry out some absurd fashion of a season, can with very little difficulty, although at considerable cost, adapt the whole power so as to apply the plant to the new demand; and if the new fashion has emanated from a distance, the manufacturer seeks, as manufacturers have done for centuries, the best native workmen to direct his production of the "last new thing"; for, after all, the more we look into the processes by which so many wonderful objects that we require, or fancy that we require, for our daily wants are produced, the more we shall find that the aid of the artist, the thinker, the thorough workman, is most required.

We can scarcely accept Mr. Gladstone's contemptuous expression regarding the form of the American axe, an implement on which the popular mind accredits Mr. Gladstone as a great authority; it would be difficult to suggest the form of any common and useful implement where the principle of beautiful strength and utility are more completely considered in relation to the conventional lines of beauty; the perfect wedge-shape of the blade, and the delicately curving lines of the handle. In the more abstruse regions of the commercial exercise of beauty in its most varied forms and exquisite colours, it is admitted, even in France, that Americans have the power of manipulating feminine costume so as to add a grace even to the dainty work of the Parisian. There may be some error in this opinion, we are inclined to think there must be, and such an opinion may be owing to the appearance of costumes when worn by those whose great personal attractions are allowed by all the world. We suspect that those accomplished and erudite American ladies who have gained the proud title of being able to add a glory to a Parisian toilette, would shrink from even claiming equality with their great French mistresses in their beloved art.

In those objects of commercial beauty which we all more or less desire to collect about us in our homes, the Americans are rapidly becoming most fastidious critics, and it is not difficult to point to noticeable instances amongst possessors in America of rare family historic objects of art, who are on the whole better acquainted with the real value of their possessions than the owners of similar objects generally are in Europe. And if this is admitting a little too much, it may at least be fairly conceded that the knowledge of what we understand by "art" and "taste" has increased in America within the last twenty-five years in a remarkable degree, a fact distinctly to be traced to the spread of art-education, art-literature, and art-schools, such as that Mr. Gladstone opened on the 11th inst. M.

Ayr Masons.—The Ayr masons have resumed work on the masters' terms—8d. per hour.

THE GRAVITATION OF TRAVEL.

One of the results of recent changes, and of the great dulness in the chief industries of the country, has been little marked hitherto,—the tendency of travel to gravitate towards the lowest rank. For some time—since the extension of the facilities for travelling by the third class—there was an increase in the number of travellers by that class in a more rapid ratio than by any other; and in the last two or three years there has been an absolute decrease in the number of travellers by the higher classes, whilst in many instances on the chief railways there has been a continuance of the increase in the lowest class. In the two methods there has been a general tendency of travel downwards, though there is in different districts of the country considerable variation in the ratio of that tendency. A few figures, collated from official sources, will illustrate as well as prove the facts, and will also show how markedly the extent and manner of travel on railways are altered by depression in trades and trading centres. Taking the Manchester, Sheffield, and Lincolnshire Railway, which serves a very important district of the country,—that indicated by its title,—we have facts showing that the elasticity of travel, which gave for years a constant increase, has disappeared, and that the body of that travel is contracted. The following are the numbers of persons who travelled by each class on that line during two corresponding periods of six months—the first half of 1878 and the first half of 1879:—

	1878.		1879.
First class	199,591	.....	145,090
Second class	305,210	.....	240,805
Third class	4,624,914	.....	4,011,062
Total	5,129,715	.....	4,396,957

On this large system, then, there is a falling off in the volume of traffic to a very considerable extent, the numbers in the last six months being more than 700,000 less than in the corresponding period of last year. But it is clear that the declension is by far the largest in the two upper classes, whilst in the first class the percentage of decrease is almost alarming in its magnitude. Turning now to the North-Eastern Railway, we have, for the same two half-years, the following as the state of the passenger traffic numerically:—

	1878.		1879.
First class	541,891	.....	443,445
Second class	739,765	.....	643,855
Third class	11,686,454	.....	11,172,587
	12,928,110	.....	12,259,887

A falling off of 58,000 in the first-class, of 95,000 in the second-class, and of 514,000 in the third-class, sufficiently attests the reduction in the volume of travel. On the North-Eastern the volume of first and second class traffic is less than it was when the line was little more than half its present extent. Turning now to the Midland Railway, we have the following as the numerical result of the working of the two classes of traffic on that line:—

	1878.		1879.
First class	1,150,926	.....	997,958
Third class	11,326,754	.....	10,695,772
Total	13,477,680	.....	11,683,730

A marked decrease of nearly 800,000 passengers shows the effect of depression in trade and unseasonable weather on this great line; but here it is noticeable also that whilst in the first class the numerical falling off is about 15 per cent., in the third class the declension is little more than a third of the ratio. Turning now to one of the great passenger lines—the Great Northern—we have for the same two periods of six months the following results:—

	1878.		1879.
First class	526,121	.....	471,085
Second class	1,199,680	.....	1,117,857
Third class	7,281,384	.....	7,135,639
Total	9,007,185	.....	8,724,581

On this line, despite the addition to the mileage worked during the half-year, there has been a falling off of over a quarter of a million passengers; but though the loss numerically has been great in every class, it has been the greatest in proportion in the two upper classes. And here it may be repeated that the financial results are generally more emphatic in their testimony as to that gravitation to the lowest level than the numbers. On the line last named, the Great Northern—the loss of revenue is about 8,000*l.* on the first-class traffic, about 6,000*l.* on the second-class traffic, and about 4,700*l.* on the third-class traffic; so that it is apparent that the numerical loss involves the transfer to the cheapest class of passengers travelling the longest distances.

As a final example we have that of the great London and North-Western Railway, on which, for the same two periods of six months, the number of travellers was as follows:—

	1878.		1879.
First class	1,408,700	.....	1,273,912
Second class	2,459,619	.....	2,291,199
Third class	18,268,149	.....	17,491,744
Total	22,136,363	.....	20,966,848

Again, there is a lessened volume of traffic; the first-class showing a declension approaching 10 per cent.; the second-class one of similar ratio; and the third-class one of less than half that proportion. It may be added that the financial results prove even more strongly that the falling off is greatest in ratio in the upper, and especially in the highest class. The figures thus quoted from official sources prove that there is not only a gravitation in travel to the lowest level, but that in addition there is a lessened volume on most of the great lines of railway. In part the prolonged winter may have caused this; but in part also the deep depression in trade is responsible for it. But all the facts obtainable prove that the greater dependence of all the great railway companies is now on the third-class traffic, which, at one time only tolerated, has become the chief source of passenger revenue on railways. And as last year the tendency of travel was to gravitate from the highest to the lowest class, so as to cause the numbers in the latter to increase, the causes which brought this about have now further operated to cause a diminution of the volume on most of the chief railways. It will be noticed that on the three largest railways, the figures for which are given above, that there is not only a gravitation in that stream of travel downwards, but there is also a very considerable falling off in the total volume, which, on the London and North-Western, the Midland, and the North-Eastern, is to the extent of 3 millions in the half-year, and, so far as can be ascertained from the weekly traffic returns, that declension continues. It may, therefore, be accepted as a fact that there will not only be a gravitation in the traffic downwards, but there will also be found at the close of the present year to have been a material diminution in the volume of that traffic—though it is probable that on certain lines the latter symptom will be chiefly shown—the former on others not being so fully affected by the trading depression and dulness.

ASSERTED SAXON CHURCH, ESCOMB, DURHAM.

At the Yarmouth Congress of the British Archæological Association, the following paper by Dr. Hooppell, of Byers-green, was read:—

"It would have been thought impossible, in this age of knowledge and research, that there should have been still in existence, in so populous a county as that of Durham, a perfect Saxon church, entirely overlooked by and unknown to archæologists until a few weeks ago, but, strange as it may appear, such has been actually the case. The ancient parish church of Escomb is a perfect specimen of Saxon architecture. It stands in the centre of a small triangular village, bearing in every feature the impress of great antiquity, on the slope of a hill by the southern bank of the Wear, two miles from the market town of Bishop Auckland, but neither on nor near any main road, the lane which leads to it and ends at it being the only road in the vicinity. For centuries it was but a chapelry to St. Andrew's Auckland, until, in the lifetime of the present generation, it was made an ecclesiastical parish. Hence, no doubt the obscurity in which it has remained. About seventeen years ago, the churchyard having become so excessively crowded that a new burial-place was absolutely necessary, a new building was erected about half a mile from the village, nearer to Auckland, to serve at once the purposes of a church and of a cemetery chapel, and the old parish church was abandoned for the lately-erected edifice. With praiseworthy regard, the present vicar, the Rev. T. E. Lord, who succeeded to the benefice some time afterwards, though not fully aware of the extremely interesting character of the ancient edifice, had the walls of the churchyard round it raised, the ground kept somewhat in order, and trespassers restrained, but the building itself was left to the forces which, with marvellous rapidity, impress upon any deserted edifice the symptoms

of decay. At the present moment many shingles from the roof have slipped from their places, and lie shattered in the churchyard. The glass of the windows is gone. The floor is damp and mossy. And the time when the building would have to be spoken of as a ruin is hastening on apace.

It was the good fortune of the writer to be the first to recognise the true character of the building. Indeed, no trained archæologist can set eyes upon it for a momount without detecting it. It is recognisable at the first glance, and succeeding examination only confirms undeniably and abundantly the immediate conclusion. Since its discovery by the writer, he has had the pleasure of conducting over it the Archæological and Architectural Society of Durham and Northumberland, who were deeply impressed with the existence and condition of the church, and, holding their meeting for the day upon the spot, passed a resolution:—'That it is extremely desirable that a fund should be raised, with as little delay as possible, for the complete repair and restoration of the old parish church at Escomb, with a view to its permanent preservation.' It has also been visited by many other antiquaries, and, in particular, by Mr. W. H. D. Longstaffe, well known as one of the able secretaries of the Society of Antiquaries of Newcastle-upon-Tyne, and as the editor of several of the volumes published by the Surtees Society, who has affirmed publicly that 'the church is Saxon from end to end,' and that 'he knows nothing equal to it in interest.' In addition to these testimonies, I may mention that the Newcastle Society of Antiquaries has, in its corporate capacity, contributed a liberal donation to the fund already instituted for the thorough repair of the building.

The church consists of a nave, chancel, and porch. The dimensions are very striking. The nave measures inside 43 ft. 6 in. by 14 ft. 4 in. The chancel 10 ft. by 10 ft. The porch 10 ft. by 10 ft. The nave is separated from the chancel by an arch, the walls of which are 2 ft. 5 in. in thickness. The thickness of the outer walls of the church is between 2 ft. 4 in. and 2 ft. 5 in.; of the walls of the porch, 1 ft. 10 in. The height of the nave, from floor to wall-plate, is 23 ft. 4 in.; of the chancel, 18 ft. 6 in.; of the porch, 5 ft. 9 in. The height of the nave from floor to ridge is 33 ft. 10 in.; of the chancel, 26 ft. 8 in.; of the porch, 11 ft. 4 in. There is a step from nave to chancel of 4 in. The great height of the building in proportion to its length and breadth, and the shortness of the chancel, are very remarkable. They remind those who have seen the ancient Saxon church of St. Laurence, Bradford-on-Avon, lately restored by the zeal and energetic exertions of Canon Jones, of Bradford-on-Avon, very strongly of that church, and strikingly accord with the pictures of churches extant on early illuminated MSS. The chancel arch is lofty, 11 ft. 3 in. from the floor to the spring, 13 ft. 10 in. from the floor to the crown. Its width is 5 ft. 3 in. It is simple, but thoroughly characteristic.

The walls of the church are, as will be concluded from their thickness, exceedingly massive. They are built of Roman stones, brought from the neighbouring Roman station (about two miles off) of Vinovium. Many of them have the peculiar Roman broaching or tooling upon them. One has a pellet within an annulet. Another has the letters C.V. As the stone stands in the wall, these letters are inverted. Many more evidences of Roman work may exist in the stones, at present undiscernible, as the whole church, with the exception of the west end, was covered in early times, probably in the early English period, with rough-cast plaster, the falling off or removal of which in some places has revealed those mentioned. Against the west end apparently stood the priests' house, the line of the roof of which, of the same pitch as that of the church, but lower, is very marked. A striking feature in the walls are the massive quoins at the angles, with alternating faces and edges, somewhat after the manner of 'long and short work.' The size of these quoins may be judged from an average one measured by the writer, which was 3 ft. 2 in., by 2 ft., by 11 in. Another one measured was 4 ft. 11 in. in length. They go from the ground to the wall-plate, at each of the angles of nave, chancel, and porch. The seats in the porch are massive stones of the same character, with Roman tooling on their faces.

The original windows are five in number, two in the south wall of the nave, two in the north wall of the nave, and one in the west end. The two in the south wall are round headed, the heads being formed of single stones, and the height of their sills above the floor being 13 ft. 2 in. The height of each window from sill to crown is 2 ft. 8 in., the width 1 ft. 3 in. They are deeply splayed. The height from splay to splay is 5 ft. 7 in., and the width 2 ft. 5 in. The two windows in the north wall are square headed. Their height above the floor is 13 ft.; from sill to head 2 ft. 6 in., width 1 ft. 3 in. They likewise are splayed, but not so deeply; height from splay to splay 4 ft. 10 in., width 2 ft. 5 in. The height of the window in the west wall is 25 ft. 9 in. above the floor; from sill to spring is 3 ft.; from sill to crown 3 ft. 6 in., width 1 ft. 3 in.; width of splays 3 ft.; height from splay to splay 4 ft. 3 in. This window is immediately under a characteristic bell gable, and the tolling of the bell, through so many centuries, has worn a furrow, 7 in. deep and 8 in. wide, in the stone which forms the head of this window inside, and in the stones above them.

Besides these windows there are two Early English insertions, one in the nave and the other in the chancel. The church must have been an 'old' church when these were put in. There are evident indications that at the time when they were inserted, other extensive repairs and 'improvements' were effected in the church. As has been already partly intimated, the church received then, as far as can be judged, its external and internal coats of plaster. The roof was also thoroughly repaired. There are six massive couples of principals, tied by footbeams and struts equally ponderous, which formed an open roof, of that date. But four of the footbeams of the earlier roof remain, and the spars on the south side are those of the earlier roof, repaired where they had begun to show signs of decay, while the spars on the north side were all renewed. One of the original windows on each side of the nave was also blocked at this time. The two new ones which were inserted are long, narrow, lancet windows, shouldered internally. The lines of the one in the chancel are brought down nearly to the floor to form sedilia. There is also a piscina, apparently of contemporaneous construction. The disturbance of the massive masonry by the Early English builders, for the insertion of these two windows, is strikingly apparent in the outside walls.

Besides the Early English insertions, there have been three in much more recent times. One is a wide pointed window in the south wall of the nave; the others are wide round-headed windows in the east and west ends. The original window under the bell gable was also blocked at some period, and an original door, of most interesting character, in the centre of the north wall. This door is perfect. It is 5 ft. 9 in. high from floor to head; 3 ft. wide at top, 3 ft. 4 in. or 3 ft. 5 in. at bottom. I cannot give the width at the bottom exactly, as at the present moment it is encumbered with rubbish. These are the inside measurements; outside it is 2 in. less in height, and 4 in. less in width, as the head and jambs are all recessed 2 in. inside. The head is formed of one massive stone, each jamb of three of similar character, two perpendicular, and one between them horizontal. I doubt whether any other ecclesiastical doorway of equally early age, so perfect and so interesting as this one, exists in England."

THE DEBATE ON THE WATER SUPPLY OF LONDON.

The satisfaction which certain members of Parliament seemed to find in the result of the recent debate on the water supply of London is somewhat unaccountable, because the actual result is really to be found in the words which Mr. Cross uttered at the end of his speech, and they were these:—"He was as anxious as any one could be that the whole subject should be investigated, and that immediately and in all its bearings as to whether the water supply could be improved for the benefit of the inhabitants of London; whether, if so, it could be done without seriously increasing the cost of supply to the consumer; whether the mode of supply could not be vastly improved; whether it was necessary for that purpose that the water companies should not by agreement surrender their power to somebody to be appointed by the Government, or whether there was any other mode in which the subject could be more satisfactorily dealt with. Before Parliament met again, he should take care that such an investigation should be made as might lead to such satisfactory conclusion." But, after all, what does this amount to? It means that the water supply of London will again form the subject of investigation. If the subject were unexplored ground, we might then find some satisfaction in this declaration, but, seeing that in 1866 there was a Royal Commission to examine into the question, a Select Committee in 1871, not to mention Rivers Pollution Commissions which have given much valuable attention to the subject, a further investigation seems, to a great extent, unnecessary or a mere matter of delay. Because all authorities are agreed that changes of some sort are desirable, and the committee, known as Mr. Ritchie's committee, did actually, Mr. Fawcett pointed out in the course of his very elaborate speech, state that "it will be necessary to consolidate the superseded water companies under a single authority which should administer the supply of water, not so much for profit as for public advantage." Here, then, was a distinct recommendation that, after the water companies have been superseded, their place should be taken by a central authority. Thus the sole question is how is this central authority to be constituted. For nearly all the speakers in the late debate agreed that something must be done, and this being so, the matter is ripe for the Government to take up by introducing a Bill constituting a central authority, and fairly compensating the water companies for the loss of their position. Here, again, was a point upon which all the speakers were more or less agreed, viz., that the companies should be fairly compensated. As to the mode of compensation, opinions naturally differed, and, of course, will continue to differ. Yet this seems only to show that it is for the Government of the day to bring forward some measure dealing with this subject of compensation, and then allow the various opinions which exist upon the subject to be tested by the process of a Parliamentary Debate.

We have no intention of following the recent discussion in regard to the failure of the present water-supply; the matter has often been discussed, directly or indirectly, in the columns of so many publications, the *Builder* included, that we do not propose now to say anything upon this head. But it is obvious that people will have to make up their minds as to what form the central authority to which allusion was made in the debate, shall take. Opinion seems pretty well agreed upon one point, namely, that the Metropolitan Board of Works has enough to do without taking this additional burden on its shoulders. Therefore we think that the Board of Works may be put out of sight, thus still further narrowing the question. Then comes the next question, which is, shall the central authority be purely or almost purely, a representative body, or shall it be more or less a Government department? In other words, shall it occupy in substance the position of the School Board, or that, say, of the Charity Commissioners? Because one of these shapes it must take; to say as Mr. Peel did, that it must be a public body, is what we all know. What we all desire to find out is what kind of public body should it be. Undoubtedly considerable difficulties will be found to exist when the question comes to be analysed. On the one hand, a representative body is naturally more sympathetic to the public wants, more easily moved, and generally more elastic than a Government department. On the other, a department is more easily regulated, less liable to make capricious changes. But on the whole we prefer the representative body, and we have an example in our mind of a representative body which does its work admirably. We refer to the Mersey Docks Harbour Board, which manages the whole port of Liverpool, and is one of the most noticeable bodies in England. Of course, relatively speaking, the importance of acting ably as a member of the Mersey Dock Board would be more an object of ambition to a Liverpool merchant than would service on a London Water Board be to an inhabitant of the metropolis. But a London Water Board, efficient in its character, might be constituted in some such fashion as this:—One member might be elected by the Corporation of the City, another by the Metropolitan Board of Works, another, again, might be nominated by the president of the Local Government Board, and the others be elected by the several metropolitan Parliamentary boroughs. Of course, we are by no means setting this scheme up as the one which, above all others, is the most perfect, but put it forward rather as a suggestion, and also as showing that, though it may be difficult to

light upon a scheme for the supply of water to the metropolis, it is by no means impossible. Therefore it is that we say the debate at the close of the session was not satisfactory, because it does not promise us any actual measure which may be criticised, and even if not passed at present, yet may be gradually modelled into shape, but it foretells further investigation. In regard to the question of compensation, we are quite sure Mr. Cross is himself man of business enough, even without the aid of advisers, to form some feasible plan which will bear discussion at any rate, and Mr. Sclater-Booth, with his practice in considering County Government Boards and Boards of Guardians, can surely assist his colleague to some scheme to obtain a governing and a water-supplying body. This side of a general election, to tell the truth, we fail to believe that anything can be done; but if electors in London will remind candidates of the subject it may be possible that when the new House appears, in the next Parliament we may see some Bill to carry out the better supplying of water to London on the notice-paper of the House of Commons. Clearly the subject has arrived at a stage when a Bill in Parliament should be the next move, and if the Government do not soon bring forward some measure we much hope that Mr. Fawcett will shape some Bill which may be, at any rate, discussed and, if possible, turned into an Act of Parliament. It has been supposed by some that Mr. Cross's words point to the creation of a new municipality for London, including amongst its duties the water supply. We do not so read them.

A Barrister.

THE PRESENT STATE OF THINGS.

Sir,—The prevailing feeling amongst all classes throughout England at the present moment is *discontent*. The great landowners, whose incomes are derived from rent, complain because their tenants are in many cases unable to pay, and a discount has to be made; and the tenant-farmers complain because under the influence of three or four bad seasons, they have been, in the world's competition, cultivating at a loss. The labourers complain, because, although it has been shown over and over again that the soil gives the most fruitful return to the labour of the human hand, yet the policy of the farmers and their landlords for many years past has been to totally remove, if possible, the labourer from the land, and compel him to go,—where he can. The labourers in towns complain that as a result of this policy, an undue competition is created, which not only lowers wages unreasonably, but prevents regular employment, and so produces in the labourer an idle, shiftless, unsettled feeling. The tradesman and manufacturer also complain, that although the policy of forcing labour from the country into the towns gives them a greater choice of and power over men, yet that the quality of the men so driven has deteriorated; that your town-bred labourer has not the stamina in him that your country-bred immigrant has, and that, in fact, it is a case of killing the goose that laid the golden eggs, with a further result, that for the greater part of the year, many, if not most, are dependent to some extent at least upon the poor-rate and other eleemosynary aid.

The experience of the past winter has left a deep impression on our most thoughtful workmen, while others it has only confirmed in their shiftlessness. Competition also, especially in the building trade, has been this year so keen, that, like giving twenty shillings change for a sovereign, no profit is made. In many other branches a positive loss is made, with the result in many instances of closing the works. Again, it is found that new works started on leased land in good times are unable to bear the strain of high ground rentals in these depressed times, but as this is a first charge which must be paid, be the works in profitable operation or not, it is like a millstone around the trader's neck.

Traders complain bitterly, also, of our bankruptcy laws, which enable the crafty rogue to swim while the honest man sinks, and which caused a loss to the country last year of 18 millions sterling, the laws being well described as "Thieving made easy"; and that, in consequence, a class of persons have sprung up calling themselves accountants, &c., who, with the lawyers, trade upon the debtor's necessities and rob the creditor of his legitimate dividend. Then the great merchant complains that, like *Othello*, "his occupation's gone." The telegraph and the steamship have put a girdle around the earth, so that merchant "adventurers" are no longer possible. The wants and desires and means of persons at the remotest distances are quickly and publicly known in the markets of the world, and are in consequence readily met, and in close competition, too.

Merchanting has now become in most cases mere gambling, with "heads I win, tails you lose," and all their wretched jargon of bulling and bearing and contango-ing, so different from the honest trader of former years, who was content to risk his own, and wait the event. Then the statesman is discontented because wars and rumours of wars and general unrest disquiet the world, and distract attention from that forward march of progress which we have a right to expect from past labours, and involve us in great and unnecessary expense at a time of commercial depression when our every means should be husbanded to tide us over until more prosperous times. As I said at first, everybody seems at the present time to be in a very discontented state.

What are to be the remedies for these distresses and this discontent? for without a suggestion in that direction, their mere enumeration is a thankless and a useless task. And I am not unmindful that offering advice under these circumstances is a grave and serious business, involving, it may be, when acted upon, the welfare and happiness and comfort of many fellow-countrymen. For immediate relief then, it appears to me that a large emigration is necessary. Many trades in which numbers of our people were brought up have become, by reason of invention and discovery, obsolete, and others are hopelessly overcrowded, and I cannot do otherwise, therefore, than applaud the decision of the Miners' Conference, when they determine to send out of the country a considerable number of their fellows. Trade is looking up, especially in America, and the wrench is not by any means a great one when a man may transfer himself from Liverpool to Canada by at least three lines of steamers, for the small sum of 4*l*., and at a loss of time at most of ten days. There, if he be fond of a country life, he may have a plot of good land of 160 acres in extent, simply for living on it, and in three years it becomes his own freehold. If his strength or inclination does not lead him in that direction, he may find employment in the towns, or he may cross the river into the States. Anyhow he will have entered the land from which at the present moment the bulk of the food of the people of this country is derived, and he may therefore reasonably expect to get a greater share of the necessaries of life than he has been able to get here. Those who go away will, in most cases, be workers. Then the percentage of *drones* in this hive of ours will be sensibly increased, and it will be the duty of those who remain so to alter the laws which relate to the land, that not only may the bulk of our people have a stake in the country, but may also have a portion of land into which that stake may be driven. We must abolish entail and primogeniture and settlement, as every other country with any pretensions to civilisation has done, and must give every present owner of land absolute power of disposal of it, and prohibit its being tied up in any way in the future. We should also provide that leaseholds for building purposes may be bought up, and the freehold secured to the building owner. Thirty years of this *régime* would make much alteration in a future edition of the Domesday Book, and add enormously to the wealth and comfort and happiness of our people.

In trade, I should propose to abolish debt, except for wages, for all sums under 20*l*. Nothing I know of is so conducive to prosperity in trade as ready money. People would look more closely into the quality of their goods if they were going to pay down on the nail for them than they do under the present reckless and demoralising system of credit. There would then be less need than now of a reform in our bankruptcy laws, which it is to be hoped cannot long be delayed. Then we want a cheap and good patent law, by which the real inventor, however poor, may hope to reap some reward for his labours, and not as sometimes happens now, be compelled to a costly litigation to defend his rights.

We also want a very considerable redistribution of the professional and shopkeeping classes. It is proverbial that of the former by far the larger majority must have a means of living independently of their profession, and it is notorious that with regard to the latter, and their agents, they are almost like the Kilkenny cats, ready to devour one another, and their customers too. Every builder knows far too well what it is to be pestered with travellers calling upon him, and other traders are in a similar position. The small shopkeeping class is vastly too numerous and needy, living from hand to mouth, mostly on credit, and that very short, and trade is followed by a great number, mainly because it enables them to spend five days out of seven in semi-idleness. The facilities for distribution are now so numerous and complete, that a very great diminution of the smaller class of distributors might be advantageously effected, and if they and their families could be induced to turn their attention to agriculture, we might hope for more prosperous times in future. Finally, we want a greater practice of frugality amongst *all* classes of our people.

E. Grimes.

UTILITY AND BEAUTY.

Sir,—In my last letter I endeavoured to rightly divide this subject for the purposes of accurate thinking, to show,—1. That either an object or a being may be perfectly adapted to a purpose without being beautiful; 2. That either an object or a being may be perfectly adapted to a purpose and also beautiful; 3. That a work of art may have no other utility than that of satisfying the æsthetic sense; and 4. That the greatest judgment is required in heightening with art anything which, in its fitness, is not also beautiful. But we will now pass on to review some of the economic phases of the question.

The gratification of a refined taste, at the fount of originality, is, save and except under the cover of museums, an expensive luxury. We may, indeed, say, that even then it is an expensive luxury, for museums are costly State appendages. It is very true that, by the various processes of reproduction, which are daily increasing even to a craze, the semblances of things beautiful may be cheaply disseminated; still, the purchase of reproductions is the purchase of superfluity, and the people who are engaged in a hard struggle for existence will think twice before laying out money upon anything beyond what is absolutely necessary and useful. The teeming majority, therefore, do not make any great demand for artistic and ornamental luxuries. It requires a nation to be overwhelmed with wealth, or otherwise in easy circumstances, and labour very cheap, to gratify to the full a taste for fine art. Would any Chancellor of the Exchequer, though he should advocate that the beautiful should never be divorced from the useful, have the temerity, in presenting his estimates to Parliament, to include one for damascening all the Martini-Henrys, all the heavy ordnance, all the sword-blades, and all the bayonets in the services? At present, utility,—a murderously-effective utility,—is all that has been aimed at and accomplished in arms of precision. Damascening would by no means mar their utility; it would only greatly increase their cost. It was once practised in the picturesque ages, and savages still decorate their war prahus, their paddles, and their spears. Why should we now divorce the beautiful from the useful in our firearms, and thus deprive the common soldier of an element of culture? Many of the working parts of stationary and locomotive engines also might be damascened; cannot we defer our lives till this is accomplished and railway whistles shall be attuned? We might greatly extend the list of utilities which it would be possible to ornament. But we should recollect that the embellishment of the useful, which is not always in itself beautiful, always increases the cost of production.

A barrel,—do not smile gentle reader,—a barrel is a very useful thing, but it is a thing that has been divorced from the beautiful ever since barrels had their being. Who would ever dream of ornamenting a good beery or winey barrel? The Great Tun at Heidelberg is the single exception so honoured, but that is not an every-day barrel; and yet we would venture to say that whichever nation should be pre-eminent in a Grand International Barrel Competition would in the aggregate excel in all other kinds of manufacture, for utility is the paramount consideration in its construction.

The truth is that the modern art-notion is surcharged with ornamentation, even to ridiculous excess. A nightmare of Louis Quatorze

extravagances oppresses us. There is scarcely a house or a mansion of any importance that is not overdone in artistic and ornamental display, and of the wrong kind. They are for the most part more like museums than homes of taste; there is no repose, they are like theatrical property-rooms, and the visitor feels inclined to inquire when the play will commence. How different were the Grecian homes; and if the Greeks were perfect in taste, it should be the Greeks whom we should endeavour to rival. The Grecian homes were sparse in ornament, a mural painting here and there, a few ornamental vases and bronzes, a statue or two, and some graceful hangings either drawn aside or covering the doorways. We have yet to learn the virtue of simplicity and proportion as the main elements of good taste. Yet to these qualities in the manufactures will ultimately be opened the markets of the world. This is why I urge, emphatically urge, that fitness, rigorous utility, should be the primary object of the manufacturer and the workmen, for in that training they would learn to appreciate simplicity and thoroughness; and in divesting objects of everything extraneous to this purpose, they would come to know wherein workmanship of certain kinds permits judicious heightening with art. We are always disquieting ourselves about what the French are doing. Cannot we have a taste of our own? This foolish spirit of imitation will, depend upon it, always find us behind. We cannot indulge our taste in a curtain but it must be covered with a French pattern on a lovely toned ground, a sweet thing wherewith we look forward to convince our friends of our perfect æsthetic culture; whereas a simple plain hanging, gracefully disposed, would be a much stronger evidence of good taste to the really cultivated. He who, having a grand mansion, shall be the first to exclude pictures in frames from its walls, and who shall admit nothing in the way of art but what shall be designed to occupy some appropriate position, will lead the way to a great and beneficial art reform. The development of art itself becomes more robust when it is consecrated to a purpose.

The world in the aggregate desires thorough workmanship and utility beyond everything else, and that nation which shall exhibit these qualities in the highest degree will have the greatest number of customers. For this principle conforms to a world-wide economical policy; and even in the art manufactures, that nation will lead which shall exhibit moderation and economy in matters of taste. Simplicity in the long run will beat the excessive and overdone in decoration. Even the wealthy will hail a taste which shall dispense with the extravagantly expensive, the unnecessary, and the profuse; and this economy will in the end prove favourable to the encouragement of the higher forms of art, for the rich will then have capital to spare for painting and sculpture out of the savings upon gewgaws. The English æsthetician would have ornament everywhere, and over everything; he has no appreciation of plain spaces, of repose. He will be content with nothing less than a metropolis all art and decoration. His art taste is founded on the national Christmas pudding,—he must have richness throughout. He has no conception of the value of contrast, of concentrating art at emphatic points, and thus poor, well-meaning, and simple-minded folk are put to the blush, and made to fancy that their taste is very much worse than it is.

Orators upon the commercial value of the beautiful would do well in discoursing upon this favourable topic to recollect that it is not upon arms of precision, upon ploughshares, pickaxes, and spades that the beautiful is required to be displayed, but upon public buildings, and the homes and surroundings of the wealthy. This is the speciality of the artist and artist workman. In the art manufactures, the greatest success will be attained by purchasing the direction of the best artists. The credit of Wedgwood was due to his enterprise,—the success of his wares was due to Flaxman and others. We need men to discourse upon art who understand what they are talking about, not amateurs who have a confused smattering of notions, any one of which coming uppermost is paraded as if it were a general law established on the soundest of bases. Let us have no more of this; for, though it may be laughed at by men who really understand the principles of art, it only serves to confuse those who require to be rightly instructed.

W. Cave Thomas.

THE NEW POST-OFFICE SAVINGS BANK BUILDINGS.

With the completion of the Government new Post-Office Savings Bank buildings, now in progress in Queen Victoria-street, that new thoroughfare will have been entirely built up from its junction with New Bridge-street, Blackfriars, to the Mansion House. The new Post-office buildings are now almost externally completed, the fifth, or top, story having been reached. The structure is chiefly distinguishable for its unusual height and length, and its massiveness and strength. It has a frontage to Queen Victoria-street 146 ft. in length, and is upwards of 80 ft. in height, being the loftiest building in the thoroughfare, and about 20 ft. higher than the British and Foreign Bible Society's premises, which it immediately adjoins. The elevation is entirely in Portland stone, the ground and first floors being rusticated. Each floor contains a range of eleven lofty windows, those from the first floor to the top of the building being alternately surmounted by arches and pediments. The main cornice is exceptionally large, being nearly 5 ft. in depth, and projecting between 3 ft. and 4 ft. beyond the general face of the elevation. The cornice will be surmounted by a parapet about 3 ft. in height. Apart from the five floors there is a basement, the windows of which are deeply recessed, and rise to a height of several feet above the street line. There are two spacious arched entrances to the building, one at the east and the other at the west end.

Internally, all the floors rest on iron girders and columns, from the basement and ground floor to the upper story, and it is computed that the weight of iron in the building amounts to about 900 tons. All the floors are intended to be made strictly fire-proof. The building extends to an average depth of about 100 ft., and covers a ground area of nearly 15,000 superficial feet. The general business of the Savings Bank will be conducted on the ground floor, while the upper part of the building will consist of offices for the clerks employed in this department of the Post Office.

Mr. Williams, of her Majesty's Office of Works, is the architect, and Mr. W. Brass the contractor.

A CO-OPERATIVE BUILDERS' SUPPLY ASSOCIATION.

The principle of co-operation appears to be permeating through all classes of society,—trading, commercial, and professional men. Amongst others of its class the latest announced of these societies is the "Co-operative Foundry and Builders' Supply and Advance Association," the prospectus of which states that it was registered on the 7th of the present month, with twenty-two articles, and a capital of 25,000*l.* in 5000 A shares of 1*l.*, and 4000 B shares of 5*l.* Amongst the signatures are several well-known city men in the iron and other trades connected with building; also a number of architects, surveyors, and builders, all of whose names and addresses are given. It is stated that the objects of the association is to acquire the business of Messrs. Macphail & Co., of Upper Thames-street, with its machinery, stock-in-trade, and plant, and to manufacture, sell, and deal, in iron and metal-work, foundry, wood, and cabinet work, and all fittings and articles used by builders.

DISCOVERY IN THE LAKE OF GENEVA.

M. Morel Fatio, who is carrying on investigations respecting pile structures in Lake Leman, has just found a large boat, dating probably from the time of the lake-dwellers, which, excepting some trifling injury to its stern, is in a perfect state of preservation. This "one-tree," of a large fir trunk, is 32 ft. long and 2¾ ft. wide. The bow is decorated with carving. This relic of pre-historic times has been moved to the museum of Lucerne.

Antwerp Cathedral.—A note of warning as to the threatening condition of the tower and spire of Antwerp Cathedral comes from Paris. A writer in the *Figaro* asserts seriously that unless proper works of repair be immediately and efficiently undertaken, the open work which surmounts the tower will become a ruin dangerous to the passers-by.

THE QUALIFICATIONS OF TOWN SURVEYORS.

Sir,—The attention now being directed to this subject, through the medium of your columns, may ultimately be of benefit, but I am hardly able to hope for this desirable end in the face of such extravagant demands as that urged by "Progress," in your issue of August 23rd. The attainment of such an excessively high standard of engineering knowledge and experience is possible only to a small minority of professional men, to whom, consequently, the care of the *larger* boroughs should be confided. Even "Progress" seems to have some idea of this kind, as he proposes to limit these qualifications to the engineers of towns having a population of at least 10,000. There is here, to my mind, a serious flaw in his argument; for it is not so much in the larger towns that the cause for complaint on the score of incompetent officials exists. It is in the smaller towns, many of them already provided with well laid-out sewerage and waterworks, and thus especially requiring permanent engineering advisers, that the "quack" finds his most secure and undisturbed retreat, and where, as a consequence, the sanitary arrangements are, after all, of the most questionable character. Thanks to a marvellous provision of the Public Health Act, Local Boards are permitted to merge the important office of surveyor in the totally dissimular one of inspector of nuisances, with a result for which the Local Government Board is nominally responsible. At the same time, it must be doubted whether that body is aware of the wide extent of the mischief, otherwise it might be supposed that sanction to such dual appointments would, in a large number of instances, be refused. Of course, the local authorities plead the old excuse of cost, but this I consider is the last consideration to which attention should be paid. Permanent works are now being laid down throughout the country under totally unskilled advisers, and with an utter disregard of sanitary principles, while the management of existing works, as performed in the class of towns to which I more particularly refer, is a miserable farce, which would excite amusement were it not for the important interests which this course of action so gravely imperils. The remedy lies entirely with the Legislature. If the Local Government Board be powerless to enforce the appointment of a better class of local executive officials in each sanitary district, steps should without further delay be taken to ensure the grouping of such districts, with a view to the permanent appointment of consulting engineers, specially experienced in sanitary work. For if it be necessary to employ medical advisers to local authorities at high salaries, for the sole purpose of reporting upon existing sanitary defects, it is surely equally important that the devising and execution of the remedial works should be entrusted to men of equal ability in their own proper profession. In one sense, the work of medical officers of health may be regarded as being to a great extent exhausted. Their labours up to the present time may be looked upon as the operations of a huge commission, the result being an overwhelming unanimity of testimony as to the prevalent sanitary defects in every part of the kingdom. This being so, the appointment of skilled engineering advisers to local authorities cannot longer be shirked, unless with the deliberate intention of casting discredit upon the recommendations of medical officers by an imperfect and disastrous carrying out of the works arising therefrom. John S. Hodgson.

LOCAL BOARD SURVEYORSHIPS.

Sir,—It appears to me, and I think I can venture to say it is pretty well understood by the profession generally, that not only at Enfield, of which such strange proceedings have recently been shown up and deservedly exposed in the *Builder*, but that there are scores of places to be found where the so-called "*far-sighted* country boards" act even more inconsistently than the Enfield Board has done. For instance, allow me to inform your readers that a little time since, whilst staying at Seaton, a small but pretty watering-place on the south-east coast of Devon, when discussing the bad state of the roads there as well as the footpaths, and other matters which are under the control of the local board of that town, I was informed, to my great surprize, that they had a little while

before elected a *sailor* as their surveyor at a salary of 30*l.* the year. Yes, a person, who as I was informed, had been "ploughing the wide ocean" all his life or nearly so. Now I would ask your readers, what can a sailor understand about the duties of a board surveyor, or wherein can a person of that calling be in the least degree qualified for the post? A TRAVELLER.

GREENOCK MUNICIPAL BUILDINGS COMPETITION.

WITH reference to the designs sent in for the proposed new municipal buildings in Greenock, we have already mentioned briefly the selection made by Mr. Chas. Barry, to whom they were referred. As one or two points in the report have already given rise to comment, it will be fair to let the referee speak for himself. We therefore print his report *in extenso*:—

"Having regard to the request you did me the honour to make to me by the letter of the Town Clerk of the 5th of June last, and having regard to the further letter of the 9th of June, which by your direction he addressed to me, I have spent, as you are aware, several days at Greenock in careful and repeated examination of the fifty designs sent in competition by architects for your proposed new municipal buildings, and I may be permitted to say that during the whole of my stay my whole time and thoughts were devoted to the somewhat difficult task of advising you in this important matter.

In successive separate examinations, I had while there gradually reduced the number of plans sent in to eleven, among which I felt convinced that my final choice would lie; and having been permitted by you to have these sent to London, I have further examined and analysed them most carefully again, and now beg to lay before you the result at which I have arrived.

In my examinations I have been influenced by the desire to secure for you, so far as I may, a plan which shall, to the utmost extent possible, and under the circumstances of a competition guided by instructions such as those issued, fulfil the requirements considered by you by those instructions to be essential, and which most sufficiently deals with the question of utility and convenience in the daily working of its several departments. I have, therefore, considered these points rather than simply which design might externally be the most original and beautiful in an architectural point of view, and it is only right to some of the competitors, whose plans and designs I do not feel at liberty to recommend to your notice, to say that there are several among them with at least as high a claim, artistically, as any of those I shall presently name. At the same time, should you confirm my choice, I have no fear but that Greenock will possess a building of which she may be proud.

It was soon evident to me that as several distinct departments for public service were to be accommodated in a single building, my proper course would be to examine under several heads the different plans, having regard to these separate requirements, and then finally putting the results of these distinct examinations together, to recommend to you those plans which, on the whole, best dealt with all, or with the most of these requirements, in the most successful manner.

These separate heads of inquiry seemed to resolve themselves into the following:—

1. The most satisfactory line of road which should traverse the site from Taylor's Close to Cathcart-square, and also best serve as the mode of approach to the present Town-hall, which was required to be retained as an integral part of the New Municipal Buildings, and in connexion with the line so adopted should also provide by reasonable additions to the old town-hall the best accommodation for the large public assemblies which are held there from time to time.

2. The most suitable arrangement for easy working of the rate-hall and the several separate offices connected with it, not forgetting that the natural desire of the town would be to have an interior not only conveniently arranged, but with some reasonable architectural pretension.

3. The police department, having regard to the instructions and extent of accommodation required, its internal arrangements in reference to the police-court, and its separation from, yet easy communication with, the other city offices and the Council-chamber.

4. The distribution and relative position of the several city offices so as to secure their most convenient working, and specially the relative position of the town clerk's office and the Provost's room to the Council-chamber.

5. The means of ready access from without to the several separate departments, and to the building as a whole, by easy spacious staircases for public use, and sufficient, well-lighted, and connected corridors.

6. The arrangements and extent of the spaces proposed to be devoted to shops and offices, which might become a source of annual revenue, and meet to some extent the cost of the new building, but of course without sacrificing or making subordinate the primary use which it is destined to serve for many years to come as the administrative centre of your important and increasing town.

7. Lastly, but not altogether least, which design combining to the largest extent all the foregoing requirements should also have sufficient architectural pretensions to take a fair rank among the public buildings of the country.

Having therefore conducted my examination under these several heads of consideration, the result is as follows:—I place at the head of the list the design sent under the motto 'Art and Science,' as I find it very much in advance in nearly all its arrangements, departmental and otherwise, than any other. I beg to advise that the two premiums of 75*l.* each be awarded to the designs with the mottoes 'Omega,' 'Let Greenock Flourish.'

As you have asked me to designate the six sets I consider the best, I add in the following order three other designs with mottoes, 'Qui dit Progrès dit Labeur,' 'Ciconia,' 'M. B.'

Should the Town Council adopt my suggestions, and place the work in the hands of the author of 'Art and Science,' there are some points in which I think the plan may be improved, and I would also suggest some curtailment of the raised portions of the façades or quasi-towers, which would, I think, detract (if so numerous as shown) from the simplicity of the sky outline and the consequent dignity of the building, while these omissions would also effect some economy.

In making the above selection I have been guided, as I have already said, primarily, by the general comparative excellence of the arrangements in planning, the accommodation given to the several departments, and the utilisation of the entire site; and secondarily, by the architectural merits of each design.

To effect the first in the most complete way, it obviously follows that larger and better accommodation involves greater cube contents, and consequently greater cost, and the same remark applies in due proportion to the architectural treatment of the exterior, some designs showing plain, and others more ornate treatment, some having lofty bell towers or smaller projections above the parapet level to a greater degree than others, no doubt with the intention of producing a more imposing and pleasing sky-line, and a more dignified effect from a distance.

These several treatments affect, of course, the estimates, and in considering these it is right to point out that increased cost means, therefore, increased advantages, while, in carrying out the work, it is of course optional with the Council to have these increased advantages, or, for the sake of reducing cost, to curtail or do without them.

In the instructions to architects, it is said that the cost should not exceed 80,000*l.*, though this is not made imperative, while, on the other hand, they are specially told to utilise the whole of the space available, two directions which are somewhat inconsistent one with the other.

I venture to think that design is the most meritorious which, by careful study, shows how the whole site may be utilised to the greatest advantage, and I have been largely influenced by this consideration.

I subjoin approximate estimates of each of the above-named six designs, founded on prices for work of similar sort in Greenock, furnished to me by the Master of Works, and from local experience deemed by him to be there sufficient.

They are, it is true, lower by at least 10 per cent. than the prices which I believe, the same work would cost in London. They would range as follows, following the order of merit in which I have placed them:—

	Total Cost.	Cost of Lettable Accommodation.	Net for the Municipal Purposes.
	£	£	£
1. Art and Science	88,603	5,724	82,879
2. Omega	64,559	8,848	55,711
3. Let Greenock Flourish ...	73,134	6,155	66,983
4. Qui dit Progrès dit Labeur	70,446	12,653	57,793
5. Ciconia	82,912	7,544	75,368
6. M. B.	70,090	6,164	63,926

At London prices, I think the cost would be:—

1. Art and Science	£101,163
2. Omega	75,924
3. Let Greenock Flourish	91,606
4. Qui de Progrès dit Labeur	79,560
5. Ciconia	98,773
6. M. B.	90,926

I cannot conclude this Report without bearing testimony to the ingenuity in planning, and the artistic excellence of composition of several of the designs sent in, but which, though thus excellent in one or other single particular, are, in my opinion, less worthy, taking them in their entirety, and subject to the heads of inquiry I have above named, than the six designs I have brought prominently under your notice."

WILTSHIRE ARCHÆOLOGICAL SOCIETY.

THE annual gathering of the members of this society was held on the 12th inst. at Marlborough, under the presidency of the Marquis of Ailesbury. The report, read by the hon. sec., the Rev. A. C. Smith, stated that there are now 380 members on the books, and that there is a balance in hand of 152*l.* Sir John Lubbock, in moving the adoption of the report, congratulated the members on the flourishing state of the Society, which was due in such a great measure to the exertions of their officials, and especially to the labours of the honorary secretary, Mr. Smith.

Lord Edmond Fitzmaurice was elected President of the Society for the coming year, and the Rev. A. C. Smith and Mr. C. H. Talbot were re-elected general secretaries.

The Rev. Canon Jackson read an interesting paper on "Savernake Forest," and Lord Henry Bruce, in seconding a vote of thanks, referred to the tenure-horn mentioned by the author of the paper. There was a curious incident connected with it in which his (the speaker's) grandfather was concerned. In his time the king came and paid a visit to Savernake House, and stayed two or three days; and just as his Majesty was going away, his grandfather expressed the hope that he was pleased with his entertainment. The king assured him that he was exceedingly pleased with everything, but he had omitted to discharge a rather important duty. Perhaps he was not aware, the king told him, that his property would pass immediately into the hands of the crown if he did not discharge the duty. His grandfather on hearing this was thrown into a state of great trepidation, and inquired what the duty was. "You have forgotten," the king replied, "to blow your tenure-horn. When a king of England comes here and that horn is not blown, your property becomes forfeited to the crown." His grandfather lost no time in discharging the duty, and, fortunately, the estate still remained in the hands of his descendants.

Later in the day the members visited the churches of St. Mary the Virgin, and St. Peter and St. Paul the Apostles. The notice of the visitors was likewise directed to the "Old House" at the College (formerly the Castle Hotel), and which was previously the residence of the Seymour family. A temporary museum had also been organised.

The anniversary dinner was held in the evening at the Town-hall, the Marquis of Ailesbury in the chair. The speeches included one by Sir John Lubbock, who, in reference to the Ancient Monuments Bill, said that nothing was further from the idea of any of those who brought forward the Bill than to imagine that all the owners of ancient monuments were likely to destroy them. When the schedule was drawn up it was thought that it would be invidious to leave out any, although they were known to be safe, and it was thought best to make a list of them all, whether they were safe or not. It was only in this sense that some were included, which, he was quite sure, would be perfectly safe without any such protection. The effect of the Bill would be this, that if the owner of any one of those ancient monuments wished to destroy it, the nation would have the power of saying, "Give us the opportunity of purchasing it at a fair valuation." So that they would see that all those who, like Lord Ailesbury, were anxious to preserve the monuments, would not be interfered with the least bit in the world. That being the case, if his lordship had still been a member of the House of Commons, he should have confidently claimed him as a supporter when he brought the Bill forward again, as he proposed to do next session.

On Wednesday, the 13th, the members had an excursion to Savernake; and on Thursday visits were paid to Rockley, where a barrow had been specially opened under the direction of Mr. H. Cunnington. The party took the lower road to Barbury Castle, and proceeded thence by Ridgeway, an old British tract way to the Marlborough and Wootton Bassett road, and so on to Avebury. After visiting Silbury Hill and the stone circle, and the cromlech in Clatford Bottom, the members returned to Marlborough, and the meeting of 1879 was brought to a close.

M. VIOLLET-LE-DUC.

SIR,—Will you have the kindness to answer in your column to correspondents, for the information of Mr. Planché and myself, the following inquiries?

1. Is the *M. Eugène Emanuel Viollet-le-Duc*, who figures in this year's Royal Academy Catalogue as an Honorary Foreign Academician (and is, I presume, the famous French architect), still living? and is he the same "M. Viollet-le-Duc, architecte," who appears on the title-page as author of the "Dictionnaire Raisonné du Mobilier Français et de l'Armure"?

2. If the author of that work, and still living, who was the M. Viollet-le-Duc, who, if I mistake not, died sometime about March — May, in the present year?

The edition of "Men of the Time," to which I have access, does not quite clear up these points.

Mr. Planché, in his recently-completed "Cyclopædia of Costume," writes of the author of the "Dictionnaire Raisonné" as one recently deceased. I cannot but think this is a mistake, and I promised him to ask for the benefit of your kind assistance in clearing up the point.

W. B.

*** M. Viollet-le-Duc, author of the well-known books mentioned, is, happily, in active life. It was M. J. L. Duc, the well-known French (Classic) architect, who died not long ago.

A line in the "Notices to Correspondents" would have sufficed to answer "W. B.," but as the confusion caused by similarity of name in the case of these two distinguished Frenchmen (and which we have sought on more than one occasion to remove) still exists, we have thought it better to give prominence to this reply.

Pictures at Liverpool.—We hear that a very large number of works have been sent in for the forthcoming Autumn Exhibition of Pictures, under the auspices of the Corporation of Liverpool. It is expected in local circles that the exhibition will exceed in interest any of its predecessors. A fine display of sculpture is also promised.

ASHINGDON CHURCH, ESSEX.

SIR,—I have been much interested in the report given in your paper of August 9th of the recent excursion of the Essex Archæological Society. Mr. J. H. Parker, C.B., kindly drew my attention to Ashingdon Church in the autumn of 1873, and I went down there to examine it and make some measured drawings, as well as visiting the neighbouring churches of Canewdon and Hockley, in the search for possible Saxon remains. Subsequently I had the honour of reading a paper on the subject at one of the afternoon meetings of the Royal Archæological Institute (February 6th, 1874), having received valuable aid from Mr. Parker. My conclusions at that time pointed the same way as those of Mr. Alfred White, F.S.A., *i.e.*, that the tower was of Saxon date. Mr. Parker, I may add, was of that opinion.

EDMUND B. FERREY.

MUCHELNEY ABBEY.

SIR,—In your remarks on this abbey at the recent meeting of the Archæological Institute, you say that the Rev. S. O. Baker (not Long) gives the width of the church as 58 ft. This is outside the foundation walls; the inside would be 52 ft., as stated by me in my paper in the "Proceedings" of the Somerset Society for 1878.

T. SHELMERDINE.

METROPOLITAN WATER SUPPLY.

SIR,—Your excellent article on this all-important subject, so full of facts, should be reprinted and distributed throughout the metropolis and the length and breadth of the land. The loss by defective water supply to the great City of London and its surroundings, where every necessary and commodity of the choicest quality can be procured for its thousands of occupiers, except that of plenty of pure water,—the life-sustainer in every sense,—the article of all others which should stand pre-eminent in its importance to the community for health and prosperity, cannot be estimated in a monetary sense. And why all this quibbling and delay should stop the way cannot be understood, when so many of our cities and provincial towns have had their constant supply for many years past,—take York, Nottingham, Norwich, and others for instance,—and some of the supplies obtained under difficulties, and here we are, in many parts of this great emporium, often without water for days. Many poor families who cannot afford the ordinary necessaries of life are deprived of pure water, or impure. Such a state of things to be recorded in this the nineteenth century, will pass into history, and remain a black spot in its pages. There are more deaths caused from the want of water, and the use of bad water, than by great battles, earthquakes, or plagues. Contributions are set on foot for the survivors of the above,—abundance of money flows in from the generous public. Again and again this is repeated, year after year, and responded to with a will, placing this great country pre-eminently before the nations of the earth, yet our own destitute and poor inhabitants are forgotten in this sense, having no water, no redress, and are left to die in poverty and filth, for want of that which should be within their reach. Better to start missionaries throughout the metropolis, and ask them to make the outcry, and seek contributions from all classes, from the highest to the lowest, to aid in procuring water, and free London from the trammels that prevent this boon. If the cities and provincial towns can give water, surely some strong effort should be made to give London a constant supply. Eminent engineers have shown, over and over again, where and how this supply can be given, and with considerably less waste than this intermittent supply—this being admitted by all experienced in the subject. The 30 gallons per head per diem is calculated on the intermittent supply. Give a constant supply, under suitable fittings and proper supervision, and it will be found that 15 gallons will be ample per head per diem; and we can obtain this at the estimated cost of, say 4,000,000*l*. Pray, what is that sum to be compared with the great and beneficial advantages it will bring to all concerned?—setting aside, wiping out the great blot that overhangs the metropolis. Surely this ought to be done without much further delay. The Prince of Wales having in some measure taken up the subject, I have faith that his Royal Highness will lead on to success,—that our householders and great landed proprietors, engineers, &c., will support the Prince with all their might. Noticing your remarks on the impurities of the water in cisterns, I must encourage you to speak out. It is only the press, your journal, and those interested by practice and experience, that can give the public the benefit therefrom. Every word you have spoken can be supported by facts, and by far worse cases than you describe. If all the defective cases were sent for your publication it would make the water-drinkers of the metropolis shudder and fly from it—it would make the aristocratic householder, and more particularly the fair sex, blush with confusion and terror.

T. SUFFIELD.

Archæology in Staffordshire.—It has been suggested that, in order to avoid ground occupied by several local societies in this county, the projected new Staffordshire Archæological Society should name itself "The Salt Antiquarian Society,"—a title which (says the *Staffordshire Advertiser*) will better show its origin with the trustees of the William Salt Library, and that its essential object is that of a publishing society. A general meeting of the subscribers is to be summoned for the middle of September.

PROPER FITTINGS FOR THE WATER SUPPLY.

AT the Lambeth Police-court, before Mr. Saunders, Mr. Henry Wilson, owner of houses in Farmer-street and Sharstead-street, Kennington, was summoned at the instance of the Lambeth Waterworks Company for contravention of the regulations made under the Metropolitan Water Act, 1871, by permitting waste of water and not supplying proper fittings for the water supply.

Mr. Louttit, secretary to the company, prosecuted, and informed the court that under the regulations of the Act the Lambeth Company had spent a considerable sum to allow of the public having the constant supply of water. Some 5,000 houses were now supplied, and the system was being rapidly extended. Notice had been served on the defendant that he should have the necessary fittings ready; but, not having done so, a great waste followed. The company, although having the power, did not wish to cut off the water as the tenants would suffer and therefore, as the defendant had not done the necessary work, it was requisite to bring him to this court. It was only the desire of the company that the regulation should be carried out, and the public receive the benefit of the constant supply.

Ultimately Mr. Wilson said he was willing to make arrangements with the company with regard to the question, and to enable that to be carried out an adjournment was ordered.

Mr. Louttit said there were 2,000 houses in the same district, and only 150 had failed to comply with the regulations.

At Hammersmith, before Mr. Bridge, Mr. Brickell, a builder, was summoned by the Fulham Board of Works for erecting a new house, 17, Pownall-terrace, Fulham, without sufficient apparatus for a water supply and ash-pit.

This was the first case of the kind brought under the notice of the court.

Mr. Farman, in support of the summons, said it was taken out under the 81st section of the Metropolis Local Management Act, the defendant being liable to a penalty of 2*l*.

The house, recently finished and now occupied, was without any water supply.

Mr. Bridge said it was in direct disobedience of the Act, and might have caused disease. He imposed a penalty of 40*s*. and 2*s*. costs.

BLACKBURN HIGH-LEVEL WATER SUPPLY.

THE town of Blackburn is supplied with water by the corporation by a gravitation scheme from the hilly range on the south. There is, however, a portion of the district ranging from 450 ft. to 725 ft. above Ordnance datum, which is beyond the reach of the gravitation levels, and which has for many years suffered from the want of some adequate supply of water. According to the *Engineer*, a scheme for the supply of this high-level district was commenced some time ago, and has just been completed. At an elevation of about 600 ft. above Ordnance datum a well or shaft, 10 ft. in diameter and 31 ft. deep, was sunk into the grit rock forming the ridge or boundary line on the north of the town. From the bottom of this shaft a bore-hole of 20 in. diameter has been put down to a depth of 215 ft. from the ground surface. At this depth a supply of water adequate for the district was met with, and is now being utilised. The bore-hole was put down by the patent steam-boring machinery of Messrs. Mather & Platt, of Manchester, in a most satisfactory manner. The rock bored through was especially hard, and tested the machinery very thoroughly; but the circular-mounted steel cutters did their work in a clean manner, and produced from time to time excellent cores or samples of the rock, which have been preserved for reference. The water in the bore-hole and well rises to within 12 ft. from the surface of the ground when there is no pumping, and the flow is rapid and constant, the yield being about 70,000 gallons per day. An engine-house has been erected over the well and bore-hole, and supplied with a horizontal engine with 13 in. cylinder and stroke of 2 ft., which is employed to work bucket and plunger-pumps, which raise the water from the bore-hole, and force it to a height of 125 ft. from the engine-house floor into a covered reservoir constructed within the public park, and having a top-water elevation of 730 ft. above the mean sea-level, and from this reservoir the supply will gravitate through the high-level district. The reservoir is excavated on a hill-side slope, and its formation required the removal of about 4,000 cubic yards of hard grit rock. Advantage was taken of this circumstance to form the reservoir bottom and walls of concrete, which was prepared on the spot from the excavated rock, broken by a steam stone-breaker, and mixed with suitable proportions of Portland cement. The interior of the reservoir is lined, and the bottom is paved with brickwork in Portland cement. The covering-in of the reservoir is formed by a series of forty-eight cast-iron columns, with girders spanning from column to column transversely across the reservoir, the length of which is 160 ft., and the breadth 55 ft., the area being covered in with a series of longitudinal arches in 9-in. brickwork in hydraulic mortar. The spandrels of the arches are filled in with concrete, and the whole covered with a layer of puddle, and the surface soiled over. The reservoir will contain 550,000 gallons. There has been no purchase of land, the reservoir site being, as before stated, in the Corporation Park.

The works at the reservoir and pumping station,—except the ironwork,—were executed by Messrs. J. Pickthall & Sons. Messrs. Yates, of the Canal Foundry, Blackburn, supplied and erected the pumping-engine and machinery, and the ironwork, in columns, girders, &c., at the reservoir. The works have been designed and superintended by Messrs. Brierley & Holt, civil engineers, Blackburn. The cost has been 9,500*l*.

NEW WATERWORKS.

Edinburgh.—The Moorfoot Waterworks, Edinburgh, have been for the most part completed, and are now in use. The scheme, for which an Act was obtained in 1874, was devised by Messrs. J. & A. Leslie, with the view of impounding the superfluous waters of a mountainous country on and near the north-west slope of the Moorfoot-hills, on the borders of Midlothian and Peebleshire. The district in question, drained by the South Esk and its tributary the Fullarton Burn, embraces an area of 8,078 acres; and the *Scotsman* says it was estimated that, with proper storage appliances, it was capable of affording, for the use of the city and district, a supply of 9,000,000 gallons per day, while at the same time adequate provision was made for keeping up the flow of the stream. To effect these objects, the existing Portmore Loch has been converted into a reservoir. Only a small embankment was necessary to raise the level of the water in the loch 10 ft., to increase the area to 103 acres, and to give a storage capacity, available for city supply, of 40 million cubic feet, or 250 million gallons. The bank was constructed in the usual way, with a central puddle-wall and trench, and material well rammed down on either side, so as to give an inner slope of 3 to 1, and an outer slope of 2½ to 1, a width on the top of 10 ft., and a height of 6 ft. above the top-water level. The top water, as thus raised, stands at 1,000 ft. above Ordnance datum, affording an ample head for traversing by gravitation the eighteen miles of undulating country that separate the loch from the city. From Portmore to Gladhouse, a distance of three miles and a half, a fire-clay pipe has been laid, through which the water is conveyed direct to the measuring-house, whence it passes into the main conduit leading into town. At Gladhouse, the construction across the South Esk of an embankment measuring 1,000 ft. in its extreme length, has been found sufficient to form an artificial lake with an area of about 400 acres, and a storage capacity of 1,700 million gallons. The top water of this reservoir stands at 890 ft. above Ordnance datum, the embankment rising 7 ft. above that level. There are two outlets,—one at the bottom for the discharge of compensation water, the other for town supply, some 25 ft. higher; and both passing through an upstand shaft built of ashlar masonry, and connected with the shore by a bowstring-girder gangway. From the measuring-house, above referred to, the water for town use is led off in a built aqueduct, which forms the means of conveyance as far as Gillygub Dean, a distance of one mile and three-quarters. The aqueduct debouches into a circular stone cistern, of sufficient size to keep a good head upon the iron-pipe, which from that point carries the supply to the service reservoir at Alnwick-hill. On the line of this pipe, which is partly 24 in., partly 22 in. in diameter, there are several more or less important works. The first is a tunnel, 420 yards long, cut for the most part through rock, which leads it from Gillygub Dean into the valley of the Fullarton Burn. Next comes a stone bridge, by which the pipe as well as a public road are carried across the South Esk. Several smaller bridges, including a wrought-iron one across the Penicuik Railway, besides embankments and culverts,

diversify the track as it passes on to the North Esk, which is crossed, near the gate of the Roslin Powder Works, by a stone arch of 55 ft. span and 9 ft. wide. At Alnwick-hill, about two miles and a half from Edinburgh, the water is conducted into a service reservoir, fitted with the means of effective filtration. This reservoir has a top water area of 900 ft. by 250 ft., and a depth of 22 ft., the slopes of the enclosing embankments being 2½ to 1 on either side, their height above the water-level 4 ft., and their width across the top 6 ft. There are two exit shafts, one for discharging overflow, which is allowed to pass into St. Catherine's Burn; the other, for drawing off the water for town supply, as near the surface as possible. The water so drawn off is delivered into a semicircular chamber, from which a pipe distributes it to such of the four filters as happen to be in use. The filter-beds, formed in the usual way of a stratum of sand, getting gradually coarser as it descends, and resting on layers of shingle and broken stones, measure each 175 ft. by 150 ft. and afford a collective filtering area of 2½ acres. Their top-water level is 401 ft. above Ordnance datum, or 20 ft. lower than that of the adjacent reservoir. The water, after trickling through the filter-beds, is led away in open-jointed fire-clay pipes to the clear-water tank, a chamber 335 ft. long by 120 ft. wide and 17 ft. deep, formed of substantial masonry and covered with a roof of brick vaulting supported on massive stone pillars. At one end of the tank, whose interior is kept cool by a covering of soil and turf, is placed a measuring-house, of the same depth, and having an area of 40 ft. by 22 ft. Externally, this structure appears as a one-story building of Classic design, surmounted by a roof of thick flags. The interior is fitted with a set of wire screens, intended to separate insects or dust from the water passing through them; and as the town supply flows off into the service-pipes, the quantity given out can be measured, from time to time, by shutting off the connexion with the clear-water tank, and noting how long the level in the cistern takes to fall a certain number of inches. Of the subsidiary works required for compensation purposes, only the Edgelaw reservoir has yet been commenced. Besides providing compensation to the river, the trustees were bound by their Act of Parliament to furnish three-quarters of a million gallons per day, to be divided among the landowners whose properties might be considered as affected by their operations, including the Duke of Buccleuch, the Marquis of Lothian, and Mr. Dundas of Arniston.

Cumberland.—The Crummock waterworks, for the supply of Cockermouth, Workington, and district, from Crummock Lake, have been opened. The works commence on the east or Brackenthwaite side of the lake, about 400 yards up stream from the neck or exit of the river Cocker from the lake, by a tube, projecting over the steep shore into deep water, 15 in. in diameter, and continued of that size to Cockermouth reservoir, where the pipe is reduced to 14 in. in diameter, and continued to about half a mile west of Brigham, where it is further diminished to 13 in. in diameter, at which size it is continued to Stainburn, where it discharges into the Workington reservoir. The works in some parts were of a very difficult nature, from the lake down through Lanthwaite Wood, and in the meadows near Scale Hill Bridge. The cutting varied from 5 ft. to 13 ft. deep in alluvial sands and gravels, yielding water in abundance, and requiring steam power and expensive plant. There were two crossings under the river Cocker in this length, and as the invert of the gravitating main was generally about 4 ft. below the surface of the water in the river, the difficulties were aggravated so far from near Scale Hill Bridge to Corn How. Slate rock cuttings were the rule from 4 ft. to 14 ft. in depth. The rock stood on edge, and neither powder nor dynamite was efficacious in dislodging it in the trenches. Most of it had to be hagged out by manual labour. At Roperains, the conduit leaves the turnpike-road and diverges to the south, and enters a tunnel off Westray Pit Gate of about 520 yards in length, and 22 ft. deep, a part of which length was in difficult wet and spongy clays and quicksands. The track coutinues until within 200 yards of the Stainburn reservoir, where it enters lands of the Earl of Lonsdale, and joins the Workington reservoir. Messrs. D. Y. Stewart & Co., of Glasgow, have supplied the pipes and castings from Cockermouth to Workington (contract No. 1). Messrs. Thomas Edington & Sons, of the Phœnix Works, Glasgow, have supplied the pipes and castings from Lake Crummock to Cockermouth. Messrs. Lucock, Coates & Waddington originally contracted to lay pipes and do the excavations, &c., from the lake to Cockermouth (contract No. 3), but the joint committee have had to carry out themselves, under the management of their engineers, about four-fifths of their work, part of which was done by sub-contractors, and the remainder, including some of the most difficult work, by day gangs. Messrs. Kirk & Fisher laid the pipes and executed the excavations from Cockermouth to Stainburn (contract No. 4). The Glenfield Company, Kilmarnock, supplied the stop, sluice, and air valves, and also the meters and other mechanism for measuring the water to the several authorities. The whole of the works have been designed and carried out under the superintendence of Messrs. Pickering & Crompton, of Whitehaven, civil engineers, Mr. Alexander Reid, of Workington, acting as inspector during a great part of the time. The cost of the chief main will be, including all expenses of obtaining the Act and outlay of all kinds, about 28,000*l.* The rural distribution works have yet to be executed, at a probable cost of about 12,000*l.*

AN AMERICAN DINNER SERVICE.

Mr. Theodore R. Davis, of the staff of *Harper's Weekly*, has been engaged for two months upon designs for what, it is said, will be the first truly American china dinner set. It has been ordered for the White House for State dinners, and will be executed by Haviland & Co., in Limoges, the illustrations making it thoroughly American, and it is to be completed early next year. Mr. Davis's own account of it, given by an "Interviewer" in the *Times*, shows that it is designed, at any rate so far as form is concerned, on entirely wrong principles. "The soup-plate," says Mr. Davis, "is modelled from the Kalmia flower, the mountain laurel, the form being that of a bowl rather than of the narrow-based plate at present in use. It is the flower with its natural base instead of the circular base, and the decoration of this series will be simple, though strong in colour, embracing this list of subjects: A clam-bake, crab, green turtle, okra, palmetto, cabbage, maize, potato, laurel, frog, and other designs." "The form of the service-plate of the fish series is that of two scallop-shells combined." "I have introduced an independent American butter-plate, the object of which is to give a point of colour and a reflective light in the glasses. It is a pond-lily leaf, slightly curled, and upon the surface of the leaf is a drop of Haviland's faïence glaze, simulating water. The after-dinner coffee-cup is of a very novel design, and quite unlike any cup at present in use. The tea-cup is a mandarin's hat inverted. The stem of a spray of the tea-plant forms the handle." We were in hopes that our American cousins had got past deceits of this kind, and had recognised the fact that a soup-plate should look like a soup-plate rather than a flower, and that as a rule tea is not drunk out of mandarin's hats even of the highest grade. It is soothing to learn that only twenty-five sets, signed by the makers and the artist, will be sent into the world.

PROVINCIAL NEWS.

Widnes.—The Widnes Local Board have taken a lease of some premises in Alforde-street, for the purpose of providing themselves with a new board and offices. The necessary alterations are being carried out under the superintendence of Mr. T. F. Butler, builder.——Improvements are being made by the board on their roads. The high boundary-wall hitherto extsting at the front of the Wesleyan Chapel and the Drill Hall has been pulled down, so as to admit of the widening of Victoria-road, the chief thoroughfare in the town, and rebuilt much lower. The width of Victoria-road will be from 60 ft. in some places to 100 ft. in others. Other improvements are being effected by the board, under the superintendence of Mr. Thomas Higginson, their surveyor.

Hexham.—A large hydropathic establishment, erected at a cost, with land, of about 30,000*l.*, was opened on the 7th inst. at Hexham. It is for the accommodation of about 120 visitors, and stands in twenty acres of ground.

Preston.—At the Preston Police-court, on the 7th inst., Ambrose Cowburn and John Thompson were fined 5s. and costs each in one case, and ordered to pay costs in another, for "tipping" nightsoil on a piece of vacant land in Marsh-lane, and another place. The Mayor very properly said the practice of depositing such offensive matter on the vacant places in the town, upon which houses were built for the working population, must be stopped at once. Serious complaints were made of the high death-rate in Preston, and the magistrates thought the tipping of nightsoil on vacant places in the borough, upon which dwellings had been erected, was a prolific source of disease.

THE LONDON SCHOOL BOARD AND THEIR SURVEYORS.

Sir,—There is hope yet for the groaning payers of the School-Board rate for London. The Board have no doubt at last seriously decided upon reducing their expenditure; as you probably saw the other day, in a report brought up from the stationery department of the Board, it was seriously proposed to substitute "thin" for "thick" post-cards, as heretofore used in their correspondence. There is no doubt this would materially affect the rate, but a more serious matter is the saving in surveyor's expenses. The Board, some few weeks back, sent a circular to each of their surveyors, asking at what percentage he would be willing to take out the whole of the remaining quantities for the schools, supposing it were given into his hands. I may mention there were five original surveyors appointed to do the whole of the work of the Board, and this appointment was made some seven years ago; but this circular was sent to thirteen surveyors. This movement, as was naturally to be expected, much, no doubt, to the delight of the Board, resulted in some extremely low tenders, ranging from the ordinary commission to as low as ¾ per cent. But now comes the *dénouement*. The result, after much deliberation, was another circular from the Board, notifying to *four* of the surveyors (who, of course, were all ¾ per cent. gentlemen) that they were appointed to divide the remaining work of the Board amongst them at 1 per cent. each. To three out of the five original surveyors a circular was sent informing them that their services were no longer required. The only satisfaction these three poor men have is, that, giving, say, 100,000*l.* worth of quantities per annum to one man at ¾ per cent. is a very different thing from dividing it amongst four at 1 per cent. You will, no doubt, agree with me that a much more simple and business-like (not to say "gentlemanly") way of effecting this reduction in surveyors' charges would surely have been first to ask the original five men, who had borne the burden and heat of the day, whether they were willing to take out the future quantities at 1 per cent.; had they refused, then to have put it up to public competition. Ratepayer.

SCHOOL-BOARD SCHOOLS.

London.—At the meeting of the School Board for London on the 30th ult., the Works Committee reported, for the information of the Board, that, in order to comply with the requirements of the Education Department that the cost of schools should not exceed 10*l.* per head, the sundry items (quoted in Mr. Aldwinckle's letter on p. 899, *ante*) were now being omitted from the tenders, and that in future a special vote of the Board would be taken in each case where it was considered desirable to add these provisions. At the same meeting the Board accepted a tender, amounting to 6,097*l.*, with 700*l.* for extras, for the erection of a school to provide seat accommodation for 800 children in St. Clement's-road, Kensington, the cost of the complete school working out at 8*l.* 10s. 8d. per head.——On the 28th ult., the Rev. John Rodgers, vice-chairman of the Board, opened a new school which has been lately erected in Gillespie-road, Highbury Vale. The school has been built to contain 1 000 children, and is shortly to be extended to the necessary capacity for 1,200. Mr. E. R. Robson is the architect.

Newcastle-on-Tyne.—The new Board school at Byker, opened on the 30th ult., is the fourth which has been opened by the Newcastle School Board, the others being at St. Peter's, Westmorland-road, and Snow-street. The Byker school is erected to accommodate 1,064 children, namely, 300 boys, 300 girls, and 464 infants. The school buildings are two stories in height, the infants being placed on the ground floor, and

ASHINGDON CHURCH, ESSEX.

Sir,—I have been much interested in the report given in your paper of August 9th of the recent excursion of the Essex Archæological Society. Mr. J. H. Parker, C.B., kindly drew my attention to Ashingdon Church in the autumn of 1873, and I went down there to examine it and make some measured drawings, as well as visiting the neighbouring churches of Canewdon and Hockley, in the search for possible Saxon remains. Subsequently I had the honour of reading a paper on the subject at one of the afternoon meetings of the Royal Archæological Institute (February 6th, 1874), having received valuable aid from Mr. Parker. My conclusions at that time pointed the same way as those of Mr. Alfred White, F.S.A., i.e., that the tower was of Saxon date. Mr. Parker, I may add, was of that opinion.

Edmund B. Ferrey.

MUCHELNEY ABBEY.

Sir,—In your remarks on this abbey at the recent meeting of the Archæological Institute, you say that the Rev. S. O. Baker (not Long) gives the width of the church as 58 ft. This is outside the foundation walls; the inside would be 52 ft., as stated by me in my paper in the "Proceedings" of the Somerset Society for 1878.

T. Shelmerdine.

METROPOLITAN WATER SUPPLY.

Sir,—Your excellent article on this all-important subject, so full of facts, should be reprinted and distributed throughout the metropolis and the length and breadth of the land. The loss by defective water supply to the great City of London and its surroundings, where every necessary and commodity of the choicest quality can be procured for its thousands of occupiers, except that of plenty of pure water,—the life-sustainer in every sense,—the article of all others which should stand pre-eminent in its importance to the community for health and prosperity, cannot be estimated in a monetary sense. And why all this quibbling and delay should stop the way cannot be understood, when so many of our cities and provincial towns have had their constant supply for many years past,—take York, Nottingham, Norwich, and others for instance,—and some of the supplies obtained under difficulties, and here we are, in many parts of this great emporium, often without water for days. Many poor families who cannot afford the ordinary necessaries of life are deprived of pure water, or impure. Such a state of things to be recorded in this the nineteenth century, will pass into history, and remain a black spot in its pages. There are more deaths caused from the want of water, and the use of bad water, than by great battles, earthquakes, or plagues. Contributions are set on foot for the survivors of the above,—abundance of money flows in from the generous public. Again and again this is repeated, year after year, and responded to with a will, placing this great country pre-eminently before the nations of the earth, yet our own destitute and poor inhabitants are forgotten in this sense, having no water, no redress, and are left to die in poverty and filth, for want of that which should be within their reach. Better to start missionaries throughout the metropolis, and ask them to make the outcry, and seek contributions from all classes, from the highest to the lowest, to aid in procuring water, and free London from the trammels that prevent this boon. If the cities and provincial towns can give water, surely some strong effort should be made to give London a constant supply. Eminent engineers have shown, over and over again, where and how this supply can be given, and with considerably less waste than this intermittent supply—this being admitted by all experienced in the subject. The 30 gallons per head per diem is calculated on the intermittent supply. Give a constant supply, under suitable fittings and proper supervision, and it will be found that 15 gallons will be ample per head per diem; and we can obtain this at the estimated cost of, say 4,000,000*l*. Pray, what is that sum to be compared with the great and beneficial advantages it will bring to all concerned?—setting aside, wiping out the great blot that overhangs the metropolis. Surely this ought to be done without much further delay. The Prince of Wales having in some measure taken up the subject, I have faith that his Royal Highness will lead on to success,—that our householders and great landed proprietors, engineers, &c., will support the Prince with all their might. Noticing your remarks on the impurities of the water in cisterns, I must encourage you to speak out. It is only the press, your journal, and those interested by practice and experience, that can give the public the benefit therefrom. Every word you have spoken can be supported by facts, and by far worse cases than you describe. If all the defective cases were sent for your publication it would make the water-drinkers of the metropolis shudder and fly from it—it would make the aristocratic householder, and more particularly the fair sex, blush with confusion and terror.

T. Suffield.

Archæology in Staffordshire.—It has been suggested that, in order to avoid ground occupied by several local societies in this county, the projected new Staffordshire Archæological Society should name itself "The Salt Antiquarian Society,"—a title which (says the *Staffordshire Advertiser*) will better show its origin with the trustees of the William Salt Library, and that its essential object is that of a publishing society. A general meeting of the subscribers is to be summoned for the middle of September.

PROPER FITTINGS FOR THE WATER SUPPLY.

At the Lambeth Police-court, before Mr. Saunders, Mr. Henry Wilson, owner of houses in Farmer-street and Sharstead-street, Kennington, was summoned at the instance of the Lambeth Waterworks Company for contravention of the regulations made under the Metropolitan Water Act, 1871, by permitting waste of water and not supplying proper fittings for the water supply.

Mr. Louttit, secretary to the company, prosecuted, and informed the court that under the regulations of the Act the Lambeth Company had spent a considerable sum to allow of the public having the constant supply of water. Some 5,000 houses were now supplied, and the system was being rapidly extended. Notice had been served on the defendant that he should have the necessary fittings ready; but, not having done so, a great waste followed. The company, although having the power, did not wish to cut off the water as the tenants would suffer and therefore, as the defendant had not done the necessary work, it was requisite to bring him to this court. It was only the desire of the company that the regulation should be carried out, and the public receive the benefit of the constant supply.

Ultimately Mr. Wilson said he was willing to make arrangements with the company with regard to the question, and to enable that to be carried out an adjournment was ordered.

Mr. Louttit said there were 2,000 houses in the same district, and only 150 had failed to comply with the regulations.

At Hammersmith, before Mr. Bridge, Mr. Brickell, a builder, was summoned by the Fulham Board of Works for erecting a new house, 17, Pownall-terrace, Fulham, without sufficient apparatus for a water supply and ash-pit.

This was the first case of the kind brought under the notice of the court.

Mr. Farman, in support of the summons, said it was taken out under the 81st section of the Metropolis Local Management Act, the defendant being liable to a penalty of 2*l*.

The house, recently finished and now occupied, was without any water supply.

Mr. Bridge said it was in direct disobedience of the Act, and might have caused disease. He imposed a penalty of 40*s*. and 2*s*. costs.

BLACKBURN HIGH-LEVEL WATER SUPPLY.

The town of Blackburn is supplied with water by the corporation by a gravitation scheme from the hilly range on the south. There is, however, a portion of the district ranging from 450 ft. to 725 ft. above Ordnance datum, which is beyond the reach of the gravitation levels, and which has for many years suffered from the want of some adequate supply of water. According to the *Engineer*, a scheme for the supply of this high-level district was commenced some time ago, and has just been completed. At an elevation of about 600 ft. above Ordnance datum a well or shaft, 10 ft. in diameter and 31 ft. deep, was sunk into the grit rock forming the ridge or boundary line on the north of the town. From the bottom of this shaft a bore-hole of 20 in. diameter has been put down to a depth of 215 ft. from the ground surface. At this depth a supply of water adequate for the district was met with, and is now being utilised. The bore-hole was put down by the patent steam-boring machinery of Messrs. Mather & Platt, of Manchester, in a most satisfactory manner. The rock bored through was especially hard, and tested the machinery very thoroughly; but the circular-mounted steel cutters did their work in a clean manner, and produced from time to time excellent cores or samples of the rock, which have been preserved for reference. The water in the bore-hole and well rises to within 12 ft. from the surface of the ground when there is no pumping, and the flow is rapid and constant, the yield being about 70,000 gallons per day. An engine-house has been erected over the well and bore-hole, and supplied with a horizontal engine with 13 in. cylinder and stroke of 2 ft., which is employed to work bucket and plunger-pumps, which raise the water from the bore-hole, and force it to a height of 125 ft. from the engine-house floor into a covered reservoir constructed within the public park, and having a top-water elevation of 730 ft. above the mean sea-level, and from this reservoir the supply will gravitate through the high-level district. The reservoir is excavated on a hill-side slope, and its formation required the removal of about 4,000 cubic yards of hard grit rock. Advantage was taken of this circumstance to form the reservoir bottom and walls of concrete, which was prepared on the spot from the excavated rock, broken by a steam stone-breaker, and mixed with suitable proportions of Portland cement. The interior of the reservoir is lined, and the bottom is paved with brickwork in Portland cement. The covering-in of the reservoir is formed by a series of forty-eight cast-iron columns, with girders spanning from column to column transversely across the reservoir, the length of which is 160 ft., and the breadth 55 ft., the area being covered in with a series of longitudinal arches in 9-in. brickwork in hydraulic mortar. The spandrels of the arches are filled in with concrete, and the whole covered with a layer of puddle, and the surface soiled over. The reservoir will contain 550,000 gallons. There has been no purchase of land, the reservoir site being, as before stated, in the Corporation Park.

The works at the reservoir and pumping station,—except the ironwork,—were executed by Messrs. J. Pickthall & Sons. Messrs. Yates, of the Canal Foundry, Blackburn, supplied and erected the pumping-engine and machinery, and the ironwork, in columns, girders, &c., at the reservoir. The works have been designed and superintended by Messrs. Brierley & Holt, civil engineers, Blackburn. The cost has been 9,500*l*.

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Edinburgh.—The Moorfoot Waterworks, Edinburgh, have been for the most part completed, and are now in use. The scheme, for which an Act was obtained in 1874, was devised by Messrs. J. & A. Leslie, with the view of impounding the superfluous waters of a mountainous country on and near the north-west slope of the Moorfoot-hills, on the borders of Midlothian and Peebleshire. The district in question, drained by the South Esk and its tributary the Fullarton Burn, embraces an area of 8,078 acres; and the *Scotsman* says it was estimated that, with proper storage appliances, it was capable of affording, for the use of the city and district, a supply of 9,000,000 gallons per day, while at the same time adequate provision was made for keeping up the flow of the stream. To effect these objects, the existing Portmore Loch has been converted into a reservoir. Only a small embankment was necessary to raise the level of the water in the loch 10 ft., to increase the area to 103 acres, and to give a storage capacity, available for city supply, of 40 million cubic feet, or 250 million gallons. The bank was constructed in the usual way, with a central puddle-wall and trench, and material well rammed down on either side, so as to give an inner slope of 3 to 1, and an outer slope of 2½ to 1, a width on the top of 10 ft., and a height of 6 ft. above the top-water level. The top water, as thus raised, stands at 1,000 ft. above Ordnance datum, affording an ample head for traversing by gravitation the eighteen miles of undulating country that separate the loch from the city. From Portmore to Gladhouse, a distance of three miles and a half, a fire-clay pipe has been laid, through which the water is conveyed direct to the measuring-house, whence it passes into the main conduit leading into town. At Gladhouse, the construction across the South Esk of an embankment measuring 1,000 ft. in its extreme length, has been found sufficient to form an artificial lake with an area of about 400 acres, and a storage capacity of 1,700 million gallons. The top water of this reservoir stands at 890 ft. above Ordnance datum, the embankment rising 7 ft. above that level. There are two outlets,—one at the bottom for the discharge of compensation water, the other for town supply, some 25 ft. higher; and both passing through an upstand shaft built of ashlar masonry, and connected with the shore by a bowstring-girder gangway. From the measuring-house, above referred to, the water for town use is led off in a built aqueduct, which forms the means of conveyance as far as Gillygub Dean, a distance of one mile and three-quarters. The aqueduct debouches into a circular stone cistern, of sufficient size to keep a good head upon the iron-pipe, which from that point carries the supply to the service reservoir at Alnwick-hill. On the line of this pipe, which is partly 24 in., partly 22 in. in diameter, there are several more or less important works. The first is a tunnel, 420 yards long, cut for the most part through rock, which leads it from Gillygub Dean into the valley of the Fullarton Burn. Next comes a stone bridge, by which the pipe as well as a public road are carried across the South Esk. Several smaller bridges, including a wrought-iron one across the Penicuik Railway, besides embankments and culverts,

diversify the track as it passes on to the North Esk, which is crossed, near the gate of the Roslin Powder Works, by a stone arch of 55 ft. span and 9 ft. wide. At Alnwick-hill, about two miles and a half from Edinburgh, the water is conducted into a service reservoir, fitted with the means of effective filtration. This reservoir has a top water area of 900 ft. by 250 ft., and a depth of 22 ft., the slopes of the enclosing embankments being 2½ to 1 on either side, their height above the water-level 4 ft., and their width across the top 6 ft. There are two exit shafts, one for discharging overflow, which is allowed to pass into St. Catherine's Burn; the other, for drawing off the water for town supply, as near the surface as possible. The water so drawn off is delivered into a semicircular chamber, from which a pipe distributes it to such of the four filters as happen to be in use. The filter-beds, formed in the usual way of a stratum of sand, getting gradually coarser as it descends, and resting on layers of shingle and broken stones, measure each 175 ft. by 150 ft. and afford a collective filtering area of 2½ acres. Their top-water level is 401 ft. above Ordnance datum, or 20 ft. lower than that of the adjacent reservoir. The water, after trickling through the filter-beds, is led away in open-jointed fire-clay pipes to the clear-water tank, a chamber 335 ft. long by 120 ft. wide and 17 ft. deep, formed of substantial masonry and covered with a roof of brick vaulting supported on massive stone pillars. At one end of the tank, whose interior is kept cool by a covering of soil and turf, is placed a measuring-house, of the same depth, and having an area of 40 ft. by 22 ft. Externally, this structure appears as a one-story building of Classic design, surmounted by a roof of thick flags. The interior is fitted with a set of wire screens, intended to separate insects or dust from the water passing through them; and as the town supply flows off into the service-pipes, the quantity given out can be measured, from time to time, by shutting off the connexion with the clear-water tank, and noting how long the level in the cistern takes to fall a certain number of inches. Of the subsidiary works required for compensation purposes, only the Edgelaw reservoir has yet been commenced. Besides providing compensation to the river, the trustees were bound by their Act of Parliament to furnish three-quarters of a million gallons per day, to be divided among the landowners whose properties might be considered as affected by their operations, including the Duke of Buccleuch, the Marquis of Lothian, and Mr. Dundas of Arniston.

Cumberland.—The Crummock waterworks, for the supply of Cockermouth, Workington, and district, from Crummock Lake, have been opened. The works commence on the east or Brackenthwaite side of the lake, about 400 yards up stream from the neck or exit of the river Cocker from the lake, by a tube, projecting over the steep shore into deep water, 15 in. in diameter, and continued of that size to Cockermouth reservoir, where the pipe is reduced to 14 in. in diameter, and continued to about half a mile west of Brigham, where it is further diminished to 13 in. in diameter, at which size it is continued to Stainburn, where it discharges into the Workington reservoir. The works in some parts were of a very difficult nature, from the lake down through Lanthwaite Wood, and in the meadows near Scale Hill Bridge. The cutting varied from 5 ft. to 13 ft. deep in alluvial sands and gravels, yielding water in abundance, and requiring steam power and expensive plant. There were two crossings under the river Cocker in this length, and as the invert of the gravitating main was generally about 4 ft. below the surface of the water in the river, the difficulties were aggravated so far from near Scale Hill Bridge to Corn How. Slate rock cuttings were the rule from 4 ft. to 14 ft. in depth. The rock stood on edge, and neither powder nor dynamite was efficacious in dislodging it in the trenches. Most of it had to be hagged out by manual labour. At Roperains, the conduit leaves the turnpike-road and diverges to the south, and enters a tunnel off Westray Pit Gate of about 520 yards in length, and 22 ft. deep, a part of which length was in difficult wet and spongy clays and quicksands. The track continues until within 200 yards of the Stainburn reservoir, where it enters lands of the Earl of Lonsdale, and joins the Workington reservoir. Messrs. D. Y. Stewart & Co., of Glasgow, have supplied the pipes and castings from Cockermouth to Workington (contract No. 1). Messrs. Thomas Edington & Sons, of the Phœnix Works, Glasgow, have supplied the pipes and castings from Lake Crummock to Cockermouth. Messrs. Lucock, Coates & Waddington originally contracted to lay pipes and do the excavations, &c., from the lake to Cockermouth (contract No. 3), but the joint committee have had to carry out themselves, under the management of their engineers, about four-fifths of their work, part of which was done by sub-contractors, and the remainder, including some of the most difficult work, by day gangs. Messrs. Kirk & Fisher laid the pipes and executed the excavations from Cockermouth to Stainburn (contract No. 4). The Glenfield Company, Kilmarnock, supplied the stop, sluice, and air valves, and also the meters and other mechanism for measuring the water to the several authorities. The whole of the works have been designed and carried out under the superintendence of Messrs. Pickering & Crompton, of Whitehaven, civil engineers, Mr. Alexander Reid, of Workington, acting as inspector during a great part of the time. The cost of the chief main will be, including all expenses of obtaining the Act and outlay of all kinds, about 28,000*l.* The rural distribution works have yet to be executed, at a probable cost of about 12,000*l.*

AN AMERICAN DINNER SERVICE.

Mr. Theodore R. Davis, of the staff of *Harper's Weekly*, has been engaged for two months upon designs for what, it is said, will be the first truly American china dinner set. It has been ordered for the White House for State dinners, and will be executed by Haviland & Co., in Limoges, the illustrations making it thoroughly American, and it is to be completed early next year. Mr. Davis's own account of it, given by an "Interviewer" in the *Times*, shows that it is designed, at any rate so far as form is concerned, on entirely wrong principles. "The soup-plate," says Mr. Davis, "is modelled from the Kalmia flower, the mountain laurel, the form being that of a bowl rather than of the narrow-based plate at present in use. It is the flower with its natural base instead of the circular base, and the decoration of this series will be simple, though strong in colour, embracing this list of subjects: A clam-bake, crab, green turtle, okra, palmetto, cabbage, maize, potato, laurel, frog, and other designs." "The form of the service-plate of the fish series is that of two scallop-shells combined." "I have introduced an independent American butter-plate, the object of which is to give a point of colour and a reflective light in the glasses. It is a pond-lily leaf, slightly curled, and upon the surface of the leaf is a drop of Haviland's faïence glaze, simulating water. The after-dinner coffee-cup is of a very novel design, and quite unlike any cup at present in use. The tea-cup is a mandarin's hat inverted. The stem of a spray of the tea-plant forms the handle." We were in hopes that our American cousins had got past deceits of this kind, and had recognised the fact that a soup-plate should look like a soup-plate rather than a flower, and that as a rule tea is not drunk out of mandarin's hats even of the highest grade. It is soothing to learn that only twenty-five sets, signed by the makers and the artist, will be sent into the world.

PROVINCIAL NEWS.

Widnes. — The Widnes Local Board have taken a lease of some premises in Alforde-street, for the purpose of providing themselves with a new board and offices. The necessary alterations are being carried out under the superintendence of Mr. T. F. Butler, builder.——Improvements are being made by the board on their roads. The high boundary-wall hitherto extsting at the front of the Wesleyan Chapel and the Drill Hall has been pulled down, so as to admit of the widening of Victoria-road, the chief thoroughfare in the town, and rebuilt much lower. The width of Victoria-road will be from 60 ft. in some places to 100 ft. in others. Other improvements are being effected by the board, under the superintendence of Mr. Thomas Higginson, their surveyor.

Hexham.—A large hydropathic establishment, erected at a cost, with land, of about 30,000*l.*, was opened on the 7th inst. at Hexham. It is for the accommodation of about 120 visitors, and stands in twenty acres of ground.

Preston.—At the Preston Police-court, on the 7th inst., Ambrose Cowburn and John Thompson were fined 5s. and costs each in one case, and ordered to pay costs in another, for "tipping" nightsoil on a piece of vacant land in Marsh-lane, and another place. The Mayor very properly said the practice of depositing such offensive matter on the vacant places in the town, upon which houses were built for the working population, must be stopped at once. Serious complaints were made of the high death-rate in Preston, and the magistrates thought the tipping of nightsoil on vacant places in the borough, upon which dwellings had been erected, was a prolific source of disease.

THE LONDON SCHOOL BOARD AND THEIR SURVEYORS.

Sir,—There is hope yet for the groaning payers of the School-Board rate for London. The Board have no doubt at last seriously decided upon reducing their expenditure; as you probably saw the other day, in a report brought up from the stationery department of the Board, it was seriously proposed to substitute "thin" for "thick" post-cards, as heretofore used in their correspondence. There is no doubt this would materially affect the rate, but a more serious matter is the saving in surveyor's expenses. The Board, some few weeks back, sent a circular to each of their surveyors, asking at what percentage he would be willing to take out the whole of the remaining quantities for the schools, supposing it were given into his hands. I may mention there were five original surveyors appointed to do the whole of the work of the Board, and this appointment was made some seven years ago; but this circular was sent to thirteen surveyors. This movement, as was naturally to be expected, much, no doubt, to the delight of the Board, resulted in some extremely low tenders, ranging from the ordinary commission to as low as ¾ per cent. But now comes the *dénouement*. The result, after much deliberation, was another circular from the Board, notifying to *four* of the surveyors (who, of course, were all ¾ per cent. gentlemen) that they were appointed to divide the remaining work of the Board amongst them at 1 per cent. each. To three out of the five original surveyors a circular was sent informing them that their services were no longer required. The only satisfaction these three poor men have is, that, giving, say, 100,000*l.* worth of quantities per annum to one man at ¾ per cent. is a very different thing from dividing it amongst four at 1 per cent. You will, no doubt, agree with me that a much more simple and business-like (not to say "gentlemanly") way of effecting this reduction in surveyors' charges would surely have been first to ask the original five men, who had borne the burden and heat of the day, whether they were willing to take out the future quantities at 1 per cent.; had they refused, then to have put it up to public competition. Ratepayer.

SCHOOL-BOARD SCHOOLS.

London.—At the meeting of the School Board for London on the 30th ult., the Works Committee reported, for the information of the Board, that, in order to comply with the requirements of the Education Department that the cost of schools should not exceed 10*l.* per head, the sundry items (quoted in Mr. Aldwinckle's letter on p. 899, *ante*) were now being omitted from the tenders, and that in future a special vote of the Board would be taken in each case where it was considered desirable to add these provisions. At the same meeting the Board accepted a tender, amounting to 6,097*l.*, with 700*l.* for extras, for the erection of a school to provide seat accommodation for 800 children in St. Clement's-road, Kensington, the cost of the complete school working out at 8*l.* 10s. 8d. per head.——On the 28th ult., the Rev. John Rodgers, vice-chairman of the Board, opened a new school which has been lately erected in Gillespie-road, Highbury Vale. The school has been built to contain 1 000 children, and is shortly to be extended to the necessary capacity for 1,200. Mr. E. R. Robson is the architect.

Newcastle-on-Tyne.—The new Board school at Byker, opened on the 30th ult., is the fourth which has been opened by the Newcastle School Board, the others being at St. Peter's, Westmorland-road, and Snow-street. The Byker school is erected to accommodate 1,064 children, namely, 300 boys, 300 girls, and 464 infants. The school buildings are two stories in height, the infants being placed on the ground floor, and

the boys and girls in a large mixed school above. The cost of the site was 1,815*l.*; contract, 7,867*l.*; furniture and fittings, 647*l.* 15*s.*; architect's commission and other expenses of superintendence, 550*l.*; other expenses, 500*l.*; flagging and paving, 500*l.*; contingencies and legal expenses, 200*l.*; making a total of 11,579*l.* 15*s.*

Huddersfield.—The foundation-stone of a new Board School in Spring-grove, Huddersfield, was lately laid. The architect is Mr. E. Hughes. The school will accommodate 308 boys, 308 girls, and 467 infants; in all, 1,083 children. The principal feature in the main building will be the central hall, 85 ft. long by 52 ft. wide, into which fourteen class-rooms open, seven on the ground-floor, and seven on the upper floor. This department will be nominally, though not really, a mixed school, the boys and girls being taught in separate class-rooms by teachers of their own sex. The boys will enter by the west door, and occupy the ground-floor; the girls will enter by the east door, and go up their own staircase to the upper story, reaching their class-rooms by means of a balcony running round the central hall, and ending in the large orchestra, which will occupy the southern half of the main room. This orchestra will accommodate more than 500 children; the upper half will be used by the girls, who will enter from the balcony, and the other half by the boys, who will enter from the floor. The class-rooms accommodate from twenty-four to seventy-two children, so as to suit the varying size of the different classes. The total cost of the school will be 14,000*l.* The contractors for the new building are as follow:—Masons, Messrs. A. Graham & Sons; joiner, William Roberts; plasterers, Tunnacliffe & Son; plumber, Smithson; slater, Hargreaves, Dewsbury; painter, A. Beevers; hot-water apparatus, James Brooke.

Gateshead.—A new Day Industrial School is now being erected on the Windmill Hills for the Gateshead School Board. The school is intended for children who, whatever be the cause, whether from having worthless and reckless parents, or from other circumstances in life likely to prove fatal to them, are verging on the criminal class. The total cost will amount to 7,251*l.*, of which 2,200*l.* is for the site. The school, which will be two stories high, will accommodate 100 boys and 100 girls. Upon the same site is being built an infants' school to accommodate 200 children. The buildings are of red brick, with stone dressings and slated roofs. The school, when completed, will be open from six in the morning until six in the evening, the age for admittance being from five to fourteen. The boys will be taught match-box-making, wood-chopping, and industries of a similar nature, the girls being well drilled in domestic occupations. The architects are Messrs. Oliver & Leeson, of Newcastle, and the general contractor is Mr. Alexander Thompson, builder, of Gateshead. Messrs. John Abbot & Co. have the contract for the engineering, plumbing, and gasfitting, and Messrs. T. Carr & Son, of Scotswood, are supplying the bricks. The work is being carried out under the superintendence of the architects and Mr. Edlington, clerk of works to the Gateshead School Board.

Edinburgh.—The new Board School for the St. Leonard's district of the city is now approaching completion. It occupies a site between Forbes-street and St. Leonard's-hill, and is a large, substantial two-story structure, intended to afford accommodation for about 900 pupils. The exterior is almost entirely destitute of architectural ornamentation. The elevation shows a spacious wing at either end, and is further relieved by a projecting block, in which both the entrances are situated, the boys entering from St. Leonard's-hill, and the girls from Forbes-street. There are in all four large school-rooms, measuring 45 ft. by 30 ft., and adjoining each are two class-rooms, situated in the wings of the building. The infant school-room, which will be provided with a gallery, is on the ground-floor, as are also the sewing-room and various juvenile class-rooms. The second-floor is entirely occupied by the juvenile department. The architect is Mr. Wilson.

Birmingham Royal Society of Artists.—The Autumn Exhibition of this Society has been opened this week. Mr. Millais, Mr. Horsley, Mr. Alma Tadema, Mr. Vicat Cole, Mr. Elijah Walton, and other well-known painters, are represented,—in several instances, however, by works which have been exhibited at the Royal Academy and elsewhere.

SCHOOL BUILDING NEWS.

Burnham (Essex).—A new school, for the accommodation of fifty children, on Wallasea Island, has been completed. The work was carried out by Mr. Charles Read, of Burnham.

Consett. — On the 29th ult. the Bishop of Durham opened the new National Schools at Consett. The schools provide accommodation for 800 children, and have been built at a cost of 3,500*l.* A portion of the school buildings was erected some three years ago, and the portion now completed is intended as a school for girls, and can also be used as a public meeting-room, for which it has been adapted by the addition of a platform and gallery.

Exeter.—On the 30th ult. the corner-stone of the new Exeter Grammar School, in Victoria Park, which is to take the place of the old school building in High-street, was laid by the bishop of the diocese. The site of the new building is an elevated and open one, and accommodation is provided not only for the buildings at present proposed, but for future additions. According to the present plan, the building as proposed will consist of two wings, running in a northerly and easterly direction. It will occupy an area of about 200 ft. by 150 ft., and arrangements are made for extending it at some future period. As far as it is proposed to build for the present, the structure will consist of a dwelling-house situated at the corner where the two wings intended for school purposes will join. This dwelling-house will be a six-story structure, and will be used as a residence for the assistant masters, matron, &c. The two wings, which will branch off from this part, will consist of a ground-floor, and first and second stories. In the north wing there will be a dining-hall, kitchens, &c., whilst in the east wing will be class-rooms, studies, and on the upper story dormitories. This wing will eventually be prolonged by the addition of a great schoolroom, in which the annual meetings can be held. It is also proposed, at some future time, to put an addition in the shape of a south wing, containing more class-rooms, studies, and dormitories, and when this is done, the assistant masters' house will occupy the centre of the front block. At present it is estimated that sixty boarders will be provided for, but when the additional accommodation is provided, it is believed that twice that number can be accommodated. The cost of the site was 7,600*l.*, and the estimated cost of the buildings is about 14,000*l.* In style, the new building is said to be what is known as Domestic Gothic of the fourteenth century. It will be constructed of red brick from Cum Davy, with Box Ground dressings, and the roof will be covered with Willand Abbey slates. The architect is Mr. W. Butterfield, and the contractors are Messrs. Stephens & Bastow, of Bristol. The clerk of the works is Mr. J. H. Newton, and the foreman Mr. C. Hampton.

Books.

Wild Flowers worth notice for their Beauty, Uses, or Associations. By Mrs. Lankester. London: David Bogue, 1879.

Mrs. Lankester's pretty book about wild flowers is so well known in its first form that we need simply say of the new edition now before us that it has been revised with the knowledge of later years, is illustrated with 108 coloured figures, and includes a new preface, in which Mrs. Lankester re-urges the value and delight of a study of botany, and points out how it may best be pursued. Young people in the country without any botanical knowledge may with the help of this book identify, name, and learn all about the bright, beautiful little things to be met with in the meadows and the hedgerows during their daily rambles. Mrs. Lankester is a safe, instructive, and pleasant guide.

The Practical Arbitrator. By Chas. Jackson, Surveyor. London: Knight & Co. 1879.

This treatise is designed particularly for the use of lay arbitrators, and sets forth succinctly and clearly the principles of the law of arbitrations, awards, evidence, and contracts, without a knowledge of which no one should venture to act in an arbitration. Mr. Chas. Jackson, who is a member of the firm of Taylor, Son, & Jackson, of Manchester, is a practical arbitrator, and has analysed and digested several larger works to produce the handy little volume before us.

Miscellanea.

Proposed New Workhouse for St. Pancras.—At a recent meeting of the St. Pancras Board of Guardians, a report was received from the Visiting Committee with respect to the reference of the board empowering the committee to act upon any resolution at which they may arrive as to the selection of a suitable site for the proposed new workhouse, and they recommended the board to close the subject for a period of three months.—Mr. Byrne moved the adoption of the recommendation. He regretted that circumstances should occur to render the delay necessary, but he believed they could make provision for the additional number required at a very trifling cost, the number at the present time being only 163 beyond the number certified by the Local Government Board; and if the board could only do that they would be master of the position.—Mr. Ross objected to the system of procrastination, for a new workhouse was much needed, and by the delay they would lose the opportunity of securing land in the parish which might suit them. They could obtain, he believed, for the present building and site, 100,000*l*; but he hoped they would not go to the expense of having two workhouses, as the expense of having two establishments would be a heavy burden upon the ratepayers. The motion for deferring the matter for three months was carried by four to three in a very thin board.

Drinking Fountain behind the Exchange.—In immediate contiguity with the unhappy-looking statue of the late Mr. George Peabody, sitting without his hat in the forecourt of a house in the Royal Exchange-avenue, there is in course of erection a drinking fountain, mainly due to the exertions and generosity of the municipal authorities connected with the Wardmote of Broad-street, Mr. Alderman Ellis, who is treasurer of the fund, having subscribed 150*l.* towards the cost of the fountain, in addition to a further subscription of 50*l.* towards a piece of statuary in Carrara marble. The fountain was designed by Mr. J. S. Edmeston, architect, and a view of it will be found in our volume for 1878, p. 353. It consists of a base and pedestal in red and grey polished granite of varied tints, and which rise to a height of 3 ft. 6 in. There are four basins, facing north, south, east, and west respectively. The upper portion of the fountain consists of a canopy in bronze, resting upon double columns at each of the four angles, surmounted by enriched capitals. An ornamental turret rises above the canopy; the extreme height of the fountain, including the base and pedestal, being about 16 ft. The statuary within the columns under the canopy consists of a full-sized seated figure of a female with a child on her knee, and designated "Charity," the work of Mr. Dalon, sculptor, of Chelsea. The entire cost of the fountain is estimated at 1,500*l.*, the expense of the statuary being 300*l.*

Wills.—The will of Mr. John Weeks, late of 32, Bartholomew-close, and of 14, Boxworth-grove, Barnsbury, builder, who died on the 1st inst., was proved on the 14th inst., by Mr. W. P. Weeks, the son, and Mr. C. W. Waters, the executors. The testator gives all his right and interest in the business of Weeks & Son, with the stock-in-trade, &c., to his son, Walter Payne, and he distributes the rest of his property, including his freehold and leasehold houses, among his three children—viz., his said son, and his daughters, Mrs. Mary Quick and Miss Bessie Weeks.—*City Press.*

The Electric Light at Blackpool.—The Corporation of Blackpool have decided to light up the Promenade with six of Siemens's electric lights, representing 6,000 candle-power, at a cost of 2,500*l.* The light will be in operation in a few weeks' time, and will be used every season for about twenty weeks. On the Thames Embankment the electric light exhibited only represents 300 candle-power, so that there will be no comparison between the display there and at Blackpool. The Corporation propose to spread the cost of the lights over ten years.—*The Electrician.*

Warrington. — The Town Council have adopted a scheme of proposed improvements at the manure depôt by Mr. Thos. Longdin, the borough surveyor, and the works are to be proceeded with. Mr. Longdin's published report gives details of Fryer's patents for conversion of garbage and street sweepings into charcoal, and merits attention.

An Architect's Mania.—M. Charles Monselet has discovered in the shop of a bookseller on the Quai Voltaire one of the most singular monuments of human idiosyncracy yet brought to light. It consists of no fewer than forty-five manuscript volumes—quite modern—written in utterly unknown characters. An assembly of *savants* having been convoked to pass an opinion on the hieroglyphics, declared that they were quite beyond their ken. The form of the letters, we are told, bears, when looked at from some distance, some resemblance to Oriental caligraphy, but this is the only description vouchsafed. Several pages are framed by borders executed with the pen in the most marvellously delicate style—flowers, animals, heraldic shields, angels, landscapes, ruins, &c.; the illuminators of missals produced nothing superior to them. M. Monselet proceeds: "And now what do these forty-five volumes contain? Everything tends to the supposition that they are memoirs, of which the author was so morbidly jealous that he created a writing peculiar to himself for the purpose of transcribing them. And this author is known; he died but a little while ago. He was an architect, very skilful in his profession, and much consulted, M. H. Legrand, to whose pen are due some important works—not in manuscript—that indicate a man of perfectly serious tastes. How, then, can we find an explanation of these many volumes in which are deposited the secrets of his inmost thoughts, destined to die with himself? And in the first place, where did he find time for writing them? I do not exaggerate in saying that by the perfection of its caligraphy, this collection represents more than two years' labour. If it be a mystification, we must allow that it has been carried out with rare patience, but for my part I prefer to attribute it to a wild and pleasing mania. I feel convinced that M. H. Legrand owed the best moments of his life to his solitary and mysterious occupation. The most surprising thing that could happen now would be to see these forty-five volumes bought up by somebody desirous to decipher the enigma they contain. The bookseller does not despair of coming across such a purchaser.—*Galignani's Messenger.*

"Round Writing."—Soennecken's system of Round Writing is practised to a considerable extent in France and part of Germany, and Mr. Hogg, of Paternoster-row, has published a methodical text-book for self-instruction, with a large number of differently-formed pens for use. The system appears to be over-elaborated, and to operate with some of the pens would demand long study and care, but for draughtsmen and lithographers many of them would be found very useful. The practice of the systems in schools, requiring, as it does, the perfect formation of every letter, would be a standing protest against the shamefully illegible scrawl in which large numbers of persons nowadays proudly indulge without thought or care for the time and convenience of others.

Wolverhampton Gas Offices.—In a limited competition for new offices and premises for the Wolverhampton Gas Company, designs were submitted by Messrs. Veall, Fleeming, Banks & Doubleday, and Johnson. That of Mr. Veall was selected by the directors, and a contract having been entered into with Mr. Henry Clark, of Wolverhampton, for the sum of 6,500*l.*, the works have been commenced. The buildings, to be situate at the corner of Darlington-street and Waterloo-road, will comprise offices, boardroom, show-rooms, warehouses, and workshops, together with a residence for the secretary; and two shops, with dwellings attached, to be let at a rental. The elevations will be in red-pressed bricks and Grinshill stone.

Surveyorship Items.—The Chester Town Council have increased the salary of Mr. I. Matthew Jones, city surveyor, from £200 to £300 per annum.——Mr. J. H. Abbey, borough surveyor of Huddersfield, has sent in his resignation, in consequence of a resolution come to by a committee of the town council to the effect that it was desirable to have a borough surveyor who was at liberty to devote the whole of his time to the duties of the office. The resignation has been accepted by the councillors, after a debate in the course of which Mr. Abbey was very highly spoken of.

Kingsbridge.—The Sanitary Authority of Kingsbridge have accepted the scheme prepared by Mr. Wallace Peggs and Mr. Catley for the sewerage and outfall works for the towns of Kingsbridge and Dodbrook.

How the Arrow-heads were Made.—A young man in the Smithsonian Institution, writes the Washington correspondent of the Cleveland *Leader*, as quoted by the *American Architect*, "has just made public the discovery of the method employed in making the stone and volcanic-glass arrow-heads, daggers, knives, axes, and razors, of the prehistoric races. Up to this time this has been a great problem to all antiquarian students; but no theory has ever been advanced showing such practical results as Mr. Cushing's. He started to solve the difficulty by putting himself in the identical position of the Aztecs or Mound-builders, without anything to work with except sticks, various shaped stones such as he could find on the banks of any stream, and his hands. After making some rude implements by chipping one flint with another, he discovered that no amount of chipping would produce surfaces like the best of those which he was trying to imitate. He therefore came to the conclusion that there was another way of doing it, and, by chance, tried pressure with the point of a stick, instead of chipping by blows of a stone; when, presto! he found that he could break stone, flint, and obsidian, in any shape he chose. Soon he had made spear-heads and daggers that would cut like a razor, as good as any he had before him, which had been picked up from all over the world. By a little more observation, he found that the "flaking," which he calls his process, on the old arrow-head left grooves that all turned one way. He produced a like result by turning his stick the easiest way from right to left. He therefore concludes that prehistoric men were right-handed people like ourselves. This conclusion is reinforced by the fact that occasionally an arrow-head is found that has flakes running from left to right, showing a left-handed person. The importance of the discovery is, that it shows that the early races were able to do this work without the use of iron or bronze, a thing long doubted."

Electric Railways.—Application has just been made to the police authorities of Berlin for permission to construct a system of tramways in the city upon which electricity will be used for motive power. The inventor, Mr. Westpfahl, has had considerable experience in the construction of rail and tram ways, and intends, if the Berlin experiment succeeds, to apply the invention in all the larger towns in Germany.—*The Electrician.*

The Tomb of the late Duke of Sussex.—A correspondent says, the tomb of his late Royal Highness the Duke of Sussex, which was erected in Kensal-green Cemetery by the Masonic brotherhood, owing to the very wet weather, is now in a most dilapidated condition, and likely to fall in, the ornamental iron work having given way. Her Royal Highness Princess Sophia's tomb opposite is in the same condition.

The New Market at Stratford.—The opening of this new market for potatoes, hay, straw, coals, &c., at Stratford, already mentioned in the *Builder*, is deferred from the 1st proximo to the 1st October next. The works have not progressed so rapidly as was expected, by reason of the unfavourable weather.

Heating and Ventilation of Turkish Baths.—A paper on this subject, by Mr. J. L. Bruce, architect, read before the Philosophical Society of Glasgow, and now printed in their "Transactions," deserves the attention of those who are interested in the subject. The experiments made by him afford valuable data.

The Builders' Strike in Bristol.—The joiners and carpenters have followed the example of the masons, and the strike in the Bristol building trade is now practically at end, a large number of the men having returned to their work at the halfpenny per hour reduction.

Burnley Joiners.—The master-joiners of Burnley have given notice of a reduction in the wages of journeymen of ½d. per hour, to come into force on the 1st September. The present wages are 32s. 6d. per week, and the reduction will be equal to 3s. 3d. per week, thus leaving them at 29s. 3d. per week.

French Archæologists.—The French Archæological Society, founded by M. de Caumont, will open their forty-sixth session on September 2. Vienne, the ancient capital of Dauphiné, is the place selected for the meeting.

Cambrian Archæological Association.—The annual congress of this Association commenced on Monday last, in Welshpool, under the presidency of Mr. J. W. Williams Wynn, M.P.

TENDERS

For the erection of laundry and stables, Basingstoke. Messrs. Raynbird & Sons, architects. Quantities by the architects:—

G. Batten	£2,265 0 0
Blunden	2,220 0 0
Kent & Lunn	2,1[illegible]5 17 6
Goodall	2,096 18 0
Wilkes	1,998 16 6
Sims, Bros.	1,977 0 0
W. W. Batten	1,961 11 0
Tigwell	1,941 16 0
Pelham	1,932 13 0
Jennings	1,915 0 0
Musselwhite	1,879 0 0

For the erection of new premises, Corporation-street, Birmingham, for Mr. Alfred Rumpage. Mr. W. H. Ward, architect:—

Whittal	£4,630 0 0
Dawson & Bradney	4,567 0 0
Bennett	4,517 0 0
Surman & Son	4,500 0 0
Robinson	4,490 0 0
Cresswell & Harrison	4,480 0 0
Garlick	4,470 0 0
Horsley, Bros. (accepted)	4,467 0 0

For the erection and completion of an Independent chapel and school-room at Kinfig-hill, Bridgend, Glamorgan. Mr. T. Thomas, architect. Quantities by Mr. S. J. Rooney:—

Jones (accepted)	£1,600 0 0

For alterations and additions to business premises, No. 55, Earl-street, Edgware-road, for Messrs. Culhane & Scott. Mr. Patrick J. J. Fay, architect:—

Jackson & Todd (accepted)	£130 0 0

For new Baptist chapel, Harlington, Middlesex. All bricks and sand provided by the trustees. Mr. Ranger, architect:—

Keen	£3,400 0 0
Wilkinson	3,340 0 0
Allen	3,000 0 0
Taylor	2,989 0 0

It being desirable to reduce the above figures, Messrs. Taylor and Allen were requested to amend their tenders after certain deductions were made, when both builders handed in the same figures. They afterwards drew lots, when the job fell to Mr. Allen, whose tender was accepted by the trustees.

For new Primitive Methodist chapel, Kingswood, Bristol, exclusive of galleries and pewing. Mr. Ranger, architect:—

Phipps (accepted)	£1,068 0 0

For new Wesleyan chapel, Chartham, Kent. Mr. Ranger, architect:—

Cozens (accepted)	£355 0 0

For New Wesleyan chapel, Blean, Kent, and the materials of old chapel. Mr. Ranger, architect:—

Foad (accepted)	£461 0 0

For the erection and completion of the Eastwood Vale Schools, in three departments, for 700 children, including the boundary-walls, tar pavement, play-sheds, &c., for the Hanley School Board. Mr. W. A. Keates, architect:—

Ellis (accepted)	£4,100 0 0

For pitch-pine parquet flooring in the banqueting-hall, Freemasons' Tavern, for the proprietor, Mr. Alfred Best. Quantities by Mr. John Pugh:—

Whiteley	£405 0 6
Howard & Sons	277 0 0
Ennor Julian & Co.	205 0 0

For alterations and additions for the Northampton Café Company, Gold-street. Mr. William Hull, architect. Quantities supplied:—

	Contract No. 1.	Contract No. 2.
Hart	£978 0 0	£96 14 0
Cosford	778 5 0	61 2 6
Ireson	760 0 0	60 10 0
Martin	690 0 0	66 0 0
Green, E. & H.	685 0 0	60 0 0
Heap (accepted)	662 0 0	58 0 0

For proposed alterations at 6, Leathersellers'-buildings, for Mr. T. Paramore. Messrs. Wilson, Son, & Aldwinckle, architects:—

Sharp & Mills	£297 0 0
Heaps	187 0 0
Beeton (accepted)	179 15 0

For pumping station (contract No. 4), sewage outfall works, for the Worksop Local Board of Health. Mr. John Allsopp, engineer:—

Brumby	£7,894 0 0
Rollitt & Wilkinson	7,250 0 0
Kellett & Bentley	6,504 0 0
Mills, Holden, & Co.	6,238 0 0
Greenwood	6,030 0 0
Bulling (accepted)	6,000 0 0
Barber	5,924 17 6

For the erection of a house and shop, 35, Little Newport-street, Soho, for Mr. G. McKoen. Messrs. J. & J. S. Edmeston, architects:—

Phillipson	£1,810 0 0
Herne	1,750 0 0
Smith	1,577 0 0
Eales	1,575 0 0
Grimwood	1,543 0 0
Langmead & Way	1,480 0 0
Gould & Brand	1,393 0 0

For new offices and premises, Darlington-street, Wolverhampton, for the Wolverhampton Gas Company. Mr. J. R. Veall, architect:—

Cockerill	£7,380 0 0
Lovatt	7,161 0 0
Higham, G. & F.	7,120 0 0
Dawson & Bradney	6,796 0 0
Clark (accepted)	6,500 0 0

For the erection and completion of the buildings and works of the Army and Navy Provision Markets, Limited, No. 121A, Regent-street, Mr. A. Bedborough, architect. Quantities supplied by Messrs. R. L. Curtis & Sons :—

	Terra-Cotta.	Stone.	Old Materials.
Sprake & Foreman	£13,500	£13,500	£185
Brass & Sons	13,307	13,307	100
Dove Brothers	13,070	13,070	80
Colls & Son	12,970	12,970	120
Chappell	12,593	12,773	70
Green & King	12,775	12,945	175

For rebuilding Nos. 10 and 11, Cursitor-street, and No. 19, Took's-court, Chancery-lane, for Mr. Alexander. Mr. Joseph Lavender, architect. Quantities supplied :—

Mortar	£3,943 0 0
Pickersgill Bros.	3,700 0 0
Atherton & Latta	3,700 0 0
Green & King	3,675 0 0
Patman & Fotheringham*	3,655 0 0

* Accepted)

For pulling down and rebuilding No. 10, Marylebone-lane, for Mr. Gilbert. Messrs. Sainsbury, Gilbert & Gardner, architects. Quantities not supplied :—

Williams & Son	£975 0 0
Simpson & Son	945 0 0
Catchpole	898 0 0
Eaton (accepted)	850 0 0

For repairs and alterations to the Court House, Marylebone-lane, for the St. Marylebone Vestry :—

French (accepted)	£344 18 0

For the erection of a fish-shop in Barking-road, for Mr. Sutton. Mr. Norman, architect :—

T. Elliss	£680 0 0!
Leniss	637 0 0
G. Cordery	353 0 0
Carey (accepted)	300 0 0!

For fittings (first portion) to York House, Regent-street, for the Junior Army and Navy Stores. Mr. A. Bedborough, architect. Quantities supplied by Messrs. R. L. Curtis & Sons :—

Hewetson & Co.	£4,094 8 9
Sage	3,995 0 0
Drew & Co.	3,795 0 0
Dodds (accepted)	3,400 0 0

For repairs, alterations, and re-decorations at the Wesleyan Chapel, Old King-street, Bristol. Mr. Herbert J. Jones, architect :—

Lewis & Son	£499 0 0
Cowlin & Son	373 0 0
Scott	370 12 9
Hodges	326 0 0

For temporary iron chapel (Wesleyan) St. Philip's Marsh, Bristol. Mr. Herbert J. Jones, architect :—

Lysaght	£600 0 0
Goodenough	400 0 0
For External Ironwork only.	
Wright & Co.	95 0 0

For finishing six houses, at Montpelier, Bristol. Mr. Herbert J. Jones, architect :—

Lewis & Edbrooke	£1,149 0 0

For finishing three houses, at Montpelier, Bristol. Mr. Herbert J. Jones, architect :—

Humphreys	£569 0 0
Forse & Ashley	512 0 0

For finishing three houses, at Montpelier, Bristol. Mr. Herbert J. Jones, architect :—

Humphreys	£240 0 0
Forse & Ashley	512 0 0 (?)
Saville	169 0 0

For new farmhouse, Stockland, Devon. Part materials supplied. Mr. Herbert J. Jones, architect :—

Trott	£430 7 0

For the erection of a Baptist Chapel at Catford-hill. Mr. H. Mill, architect :—

Morter	£3,100 0 0
Dove Bros.	2,975 0 0
Taylor & Son	2,968 0 0
Nightingale	2,798 0 0
Hill, Higgs, & Hill	2,794 0 0

For alterations and additions to the David Garrick publichouse, Catherine-street, Strand. Mr. P. J. J. Fay, architect :—

Jackson & Todd (accepted)	£135 0 0

BEDFORD.—The following tenders have recently been received by Mr. F. T. Mercer, architect :—

For two business premises, with frontages to St. Loyes and Dane-street,—

Moore (accepted)	£1,145 0 0

For alterations and additions to two residences in Offa-street and Wellington-street, for Mr. W. H. Hands. Plasterer and cementer's contract not included in the amount,—

Lilley (accepted)	£523 0 0

For a villa residence, the Plantation, near Bromham-road, for Mr. G. Fasnacht,—

Spencer (accepted, subject to alterations)	£1,120 0 0

For alterations and additions to the Working Men's Institute, Harpur-street,—

Coker	£843 10 0
Green & Hull	795 0 0
Long	676 0 0
Moore	674 0 0
Lilley	648 0 0
Harrison	640 0 0
Litchfield	639 0 0
Corby & Son	633 13 0

TO CORRESPONDENTS.

"The Architectural Association at Wells."—A further notice of buildings visited will be given in our next.

W. F. (answer depends on several matters. Take proper advice).—B. F. (case would require to be examined. Consult an architect. We cannot interfere in private disputes).—J. J. G. (Her Majesty's Board of Works, Whitehall).—A. E. (names and amounts should be given).—Subscriber (the Victoria Dock extension works have been already very fully described in our pages).—Borough Surveyors (a heap of letters on this subject shall have consideration).—H. T. (next week).—T. D. B. & Son (next week).—Z. B. (received).—C. E.—R. & Sons.—P. & Son.—L.—J. G. P.—H. J. W.—Dr. P.—T. S.—J. S. H.—O. M. S. G. J. & Co.—H. S.—G. P.—W. H. P.—A. S.—J. P.—G. P.—S. W.—M. H. J.—G. J. & Co.—J. A.—A. B.—T. B. W.—H. R.—Dr. G.—H. St. J.—J. W. P.—H. J. J.—M. & S.—I. K. V.—A. H.—W. C.—H. F. H.—A. P. H.—P. & W.—Y. P.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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